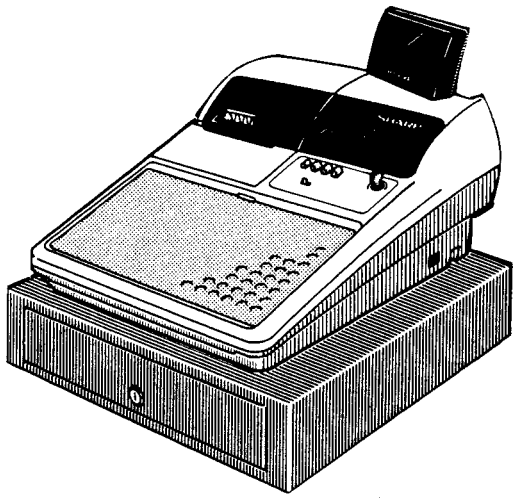
SHARP SERVICE MANUAL

CODE: 00ZERA550VSME



CASH REGISTER

MODEL ER-A550

SRV Key : LKGIM7113RCZZ
PRINTER: M-820
(For "V" version)

CAUTION
EXTREME CAUTION MUST BE TAKEN WHEN SERVICING THIS MACHINE. EVEN THOUGH THE MODE SWITCH IS IN THE ⏻ POSITION, VOLTAGE IS STILL SUPPLIED TO THE ENTIRE MACHINE.
WHEN WORKING ON THIS MACHINE MAKE SURE THAT THE POWER CORD IS REMOVED FROM THE WALL OUTLET.

CONTENTS

CHAPTER 1. SPECIFICATIONS 1
CHAPTER 2. OPTIONS 5
CHAPTER 3. SRV. RESET AND MASTER RESET 8
CHAPTER 4. HARD WARE DESCRIPTION 9
CHAPTER 5. TEST FUNCTION 27
CHAPTER 6. DOWN LOAD FUNCTION 34
CHAPTER 7. SERVICE PRECAUTION 37
CHAPTER 8. CIRCUIT DIAGRAM & PWB LAYOUT 39

PARTS GUIDE

Parts marked with "⚠" is important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

SHARP CORPORATION

This document has been published to be used for after sales service only.
The contents are subject to change without notice.

CAUTION:
The socket-outlet shall be installed near the equipment and shall be easily accessible.

VORSICHT:
Die Netzsteckdose muß nahe dem Gerât angebracht und leicht zugänglich sein.

ATTENTION:
La prise de courant murale devra être installée à proximité de l'equipement et devra être facilement accessible.

AVISO:
El tomacorriente dede estar instalado cerca del equipo y debe quedar bien accesible.

VARNING:
Det matande vägguttaget skall placeras nära apparaten och vara lätt åtkomligh.

CHAPTER 1. SPECIFICATIONS

1. Appearance/Rating

1) Appearance

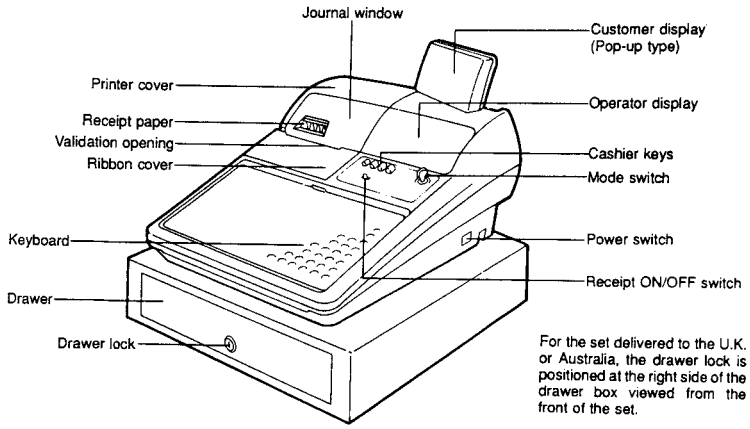


Fig. 1-1

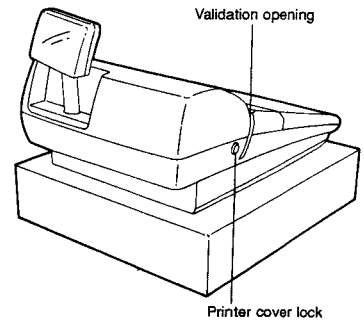


Fig. 1-2

2) Rating

Power source	AC local voltage (±10%) 50Hz
Power consumption	Standby: 15 W Maximum: 35 W, with options installed.
Operating temperature	0°C~40°C (32°F~104°F)
Operating humidity	10%~90% (RH)
Physical dimensions, including the drawer	440(W) x 496(D) x 323(H)mm
Weight	Germany: 16.8kg U.K.: 17.0kg

2. Keyboard

1) Standard keyboard layout

↑ RECEIPT	↑ JOURNAL	5	10	15	20	L 3	10	20	30	40	50	60	70	80	90
RCPT	VP	4	9	14	19	L 2	9	19	29	39	49	59	69	79	89
SLIP	GC COPY	3	8	13	18	L 1	8	18	28	38	48	58	68	78	88
AUTO 1	AUTO 2	2	7	12	17	PB -	7	17	27	37	47	57	67	77	87
NS	VAT	1	6	11	16	PB +	6	16	26	36	46	56	66	76	86
	#	⊗	•	CL	AMT	NBAL	5	15	25	35	45	55	65	75	85
⊖1	⊖2	7	8	9	PLU/SUB	CR2	4	14	24	34	44	54	64	74	84
%1	%2	4	5	6	EX1	CR1	3	13	23	33	43	53	63	73	83
P0	RA	1	2	3		CH	2	12	22	32	42	52	62	72	82
RF	∞	0	00	000	ST	TL	1	11	21	31	41	51	61	71	81

Fig. 2-1

2) Key top name

① Standard key top

Keytop	Description
0 to 9, 00, 000	Numeric keys
•	Decimal point key
C L	Clear key
⊗	Multiplication key
DEPT. 1~20	Department 1~20 keys
↑ RECEIPT	Receipt paper feed key
↑ JOURNAL	Journal paper feed key
RCPT	After receipt issue key
VP	Validation print key
#	Non-add code entry key
AUTO 1	Atutomatically entry key 1
AUTO 2	Atutomatically entry key 2
NS	No sale key
VAT	Value added tax key
SLIP	Slip print key
GC COPY	Guest check copy key
⊖ 1	Markdown 1 keys (Coupon)
⊖ 2	Markdown 2 keys (Coupon)
% 1	% 1 keys
% 2	% 2 keys
PO	Paid out key
RA	Received account key
RF	Refund key
∞	Void key
AMT	Amount key
PLU/SUB	PLU/Subdept. code entry key
EX1	Currency Exchange 1 keys
L 1	Level shift 1 key
L 2	Level shift 2 key
L 3	Level shift 3 key
PLU 1~90	Direct/Sub department keys
NBAL	New balance key
PB +	Prebious balance key plus
PB -	Prebious balance key minus
ST	Tax included subtotal key
CR 1	Credit 1 key
CR 2	Credit 2 key
CH	Check key
TL	Total key

② Option key top

Keytop	Description
DEPT. 21~50	Department 21~50 keys
PLU 91~126	Direct/Sab department 91~126 keys
⊖ 3, 4	Markdown 3 and 4 keys (Coupon)
% 3, 4	%3 and 4 keys
CR3~8	Credit 3~8 keys
CA 2	Cash 2 key
CONV 2~4	Currency Exchang 2~4 keys
AUTO 3 ~5	Automatically entry key 3~5
RA 2	Received on account 2 key
PO 2	Paid out 2 key

3. Mode switch

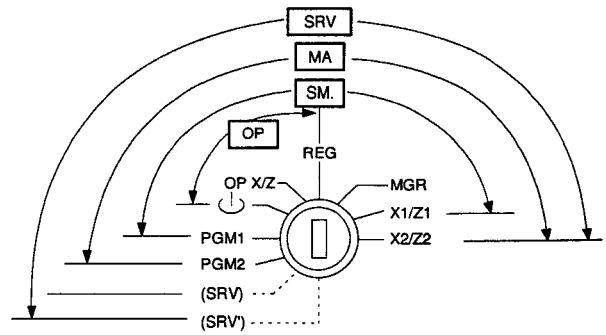


Fig. 3-1

* The key can be removed in the REG or OFF position.
* In the SRV' mode, key inputs are prohibited and no display is made.
* With the key in the off position power is still supplied to the main PWB.

[Functions]

- Function for each key position
- SRV': System reset
- SRV: Service mode (Service programming)
- PGM2: Allows programming of an item that is not changed frequently, in addition to the PGM1 mode programming.
- PGM1: Allows programming of items frequently changed (e.g. department, PLU pricing, and discount rate setting).
- OP/XZ: Allows X or Z operation by servers or cashiers.
- REG: Allows registrations.
- MGR: Allows the operations, by authorized person such as a manager (e.g. correction after transaction finished or cancellation of entry limits), which are not permitted to ordinary cashiers.
- X1/Z1: Allows reading and resetting of a day's sales total.
- X2/Z2: Allows reading or resetting sales totals in a specified period.
- ⏻: Switching off the display to prevent key board entries.
  (The setting does not turn off the AC power.)

4. Display

1) Layout

① Operator display

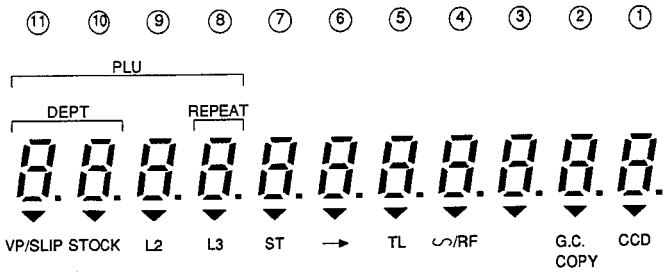


Fig. 4-1

② Customer display

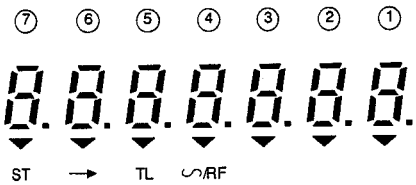


Fig. 4-2

2) Display contents

Display contents	Display position	Description
Numerals	8-1	Amount, numerals
Minus sign	8-2	– : Minus
Error message	11	E: Error message
Mode status	11	P: PGM mode, : Void mode
Department	11-10	Displayed in 2 digits (1-50). No zero suppression.
PLU	11-8	No zero suppression.
Repeat	8	Starts with "2"
Decimal point	4-1	Decimal point, TAB

3) Lamp (▼ comes on)

Notation on filter	Description
VP/SLIP	Comes on when validation printing is compulsory.
→	Comes on when change amount is displayed after tendering.
ST	Comes on when each subtotal is displayed.
TL	Comes on when transaction is finished.
L2	Comes on when the PLU level is 2.
L3	Comes on when the PLU level is 3.
∞	Comes on when a void entry or refund entry are made.
RF	Comes on when the void key on RF key a depressed
STOCK	Comes on when a PLU whose stock is negative is entered.
CCD	Comes on when CCD entry is compulsory.
G.C. COPY	Comes on at GC copy mode.

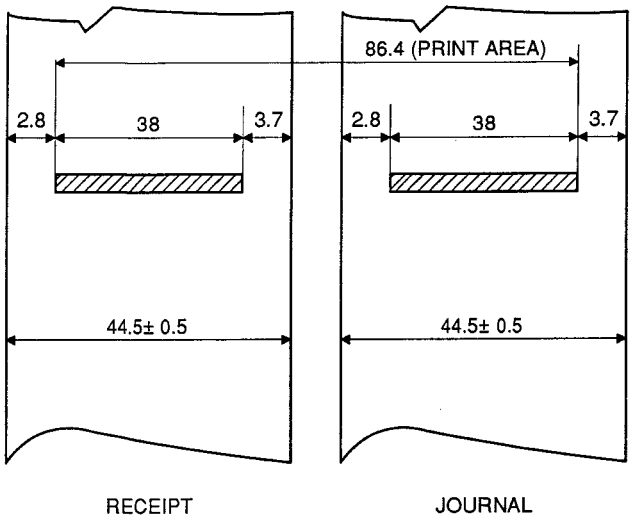
5. Printer (M-820)

1) Specifications

- Part number: M-820
- No. of stations: 2
- Printing system: Mechanical serial dot
- Direction of printing: Bidirectional
- Printing capacity: Receipt – 21 characters
Journal – 21 characters
Validation – 47 characters (one line only)
- Character size: 2.7(H) × 1.5(W) mm
Print pitch:
Column distance 1.83 mm
Row distance 4.3 mm
- Total number of dots: (95 dots per line) × 2 (receipt and journal)
Validation Max 213 dot
- Font: 7 × 7 dots
Space between characters – 1 dot
- Print speed: 2.5 lines/sec. (Approx. 24V)
- Paper feed speed: Receipt – Approx. 28.2 lines/sec.
Journal – Approx. 11.2 lines/sec.
- Reliability: MCBF – 2 million lines (excluding the print head)
Head life – 40 million characters (in the case of printing average 2 dots per character per wire
- Validation form sensor: No

2) Printing area

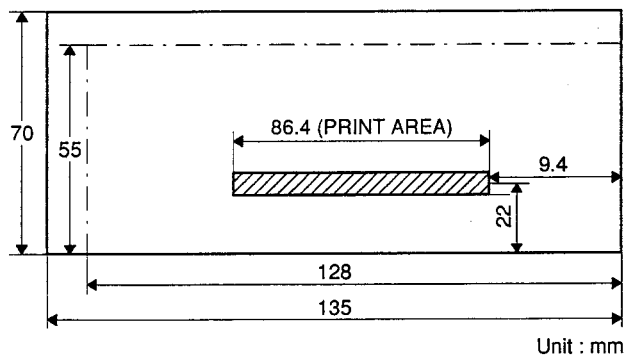
Receipt/journal



Unit : mm

Fig. 5-1

Validation form



Unit : mm

Fig. 5-2

3) Paper

- Paper roll dimensions: 44.5±0.5mm in width, 80mm in diameter
- Paper quality:

Journal
Bond paper (paper thickness: 0.06 to 0.09mm, paper weight: 52.3 to 64g/m^2)

Validation form
Thickness: 0.07 to 0.14mm
Size: 135mm or more (W) X
70mm or more (H)

4) Inking

- Ink supply system: Ink ribbon
- Form: Cartridge
- Specification: Material – Nylon
- Ribbon life: 6 million characters
- Print color: Purple (single color)

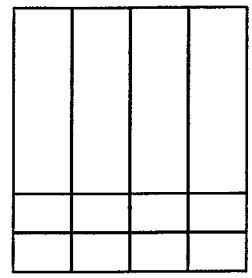
5) Logo stamp

- Material: Porous rubber
- Stamp color: Purple (single color)
- Max. stamp size: 30(W) X 20(H) mm
- Ink refill: Allowed (UINK-1001CCZZ: 5CC)

6. Drawer

1) Cash compartment

- Detachable from the drawer case
- Paper money compartment not detachable from coin compartment
- Available number of compartments
  4B/8C
- Kinds of available compartment assembly



4B/8C

- Size: 440 (W) x 460 (D) x 104 (H) mm

Fig. 6-1

2) Keylock

① For Germany

- Key lock location
  Front
- Key operation
  Lock = 180 degrees counter clockwise
  Unlock = 180 degrees clockwise rotation

② For U.K.

- Key loock location
  Side
- Key operation
  Lock = Automatic
  Unlock = 90 degre clockuise rotation

CHAPTER 2. OPTIONS

1. System configuration

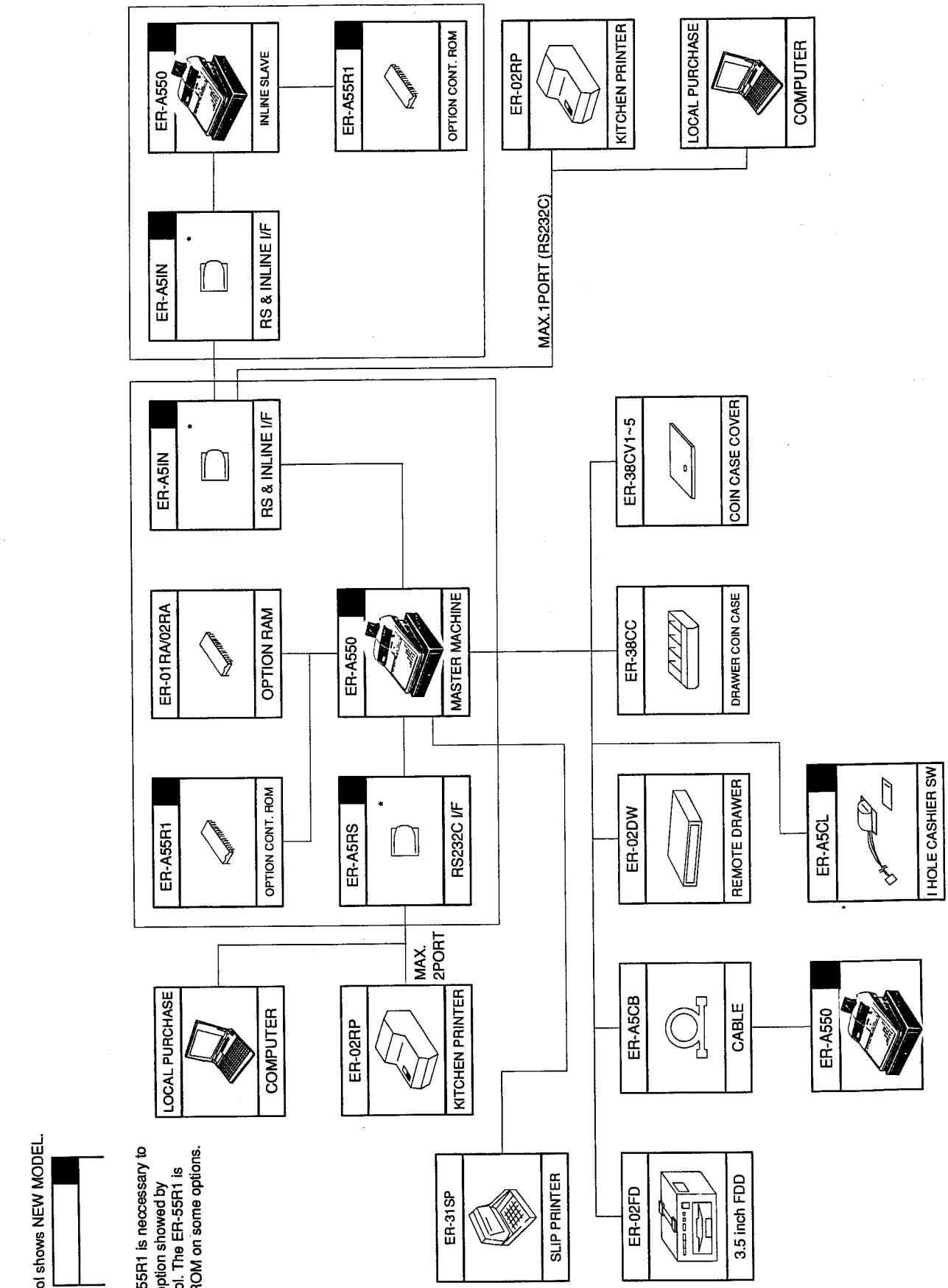


Fig. 1-1

2. Options

NO	NAME	MODEL	DESCRIPTION
1	REMOTE PRINTER	ER-02RP	Via RS-232C I/F (ER-A5IN or ER-A5RS)
2	REMOTE DRAWER	ER-02DW	MAX. 3units
3	COIN CASE	ER-38CC	4B/8C
4	COIN CASE COVER	ER-38CV1~5	For ER-38CC
5	EXPANSION RAM CHIP	ER-01RA	32K bytes RAM chip
		ER-02RA	128K bytes RAM chip
6	IN-LINE & ON-LINE SYSTEM	ER-A5IN	2ports simple inline and 1port RS-232C I/F
7	ON-LINE SYSTEM	ER-A5RS	2ports RS-232C I/F
8	CONTROL ROM	ER-A55R1	Control for ER-A5IN and ER-A5RS
9	PRESETS LOADER	ER-02FD	FD unit
10	CONNECTION CABLE	ER-A5CB	Loader cable
11	SLIP PRINTER	ER-31SP	Printer and its interface inclusive
12	ONE HOLE CASHIER SWITCH	ER-A5CL	

3. Service options

NO.	NAME	PARTS CODE	PRICE RANK	DESCRIPTION
1	SERVICE KEY	LKGIM7113RCZZ	AK	For the mode switch
2	DRIP-PROOF SWITCH COVER	GCOVB7047RCZZ	BA	
3	MODE KEY GRIP COVER	LKGIM7126RCZZ	AL	OP key only
4	DRAWER FIXING KIT	DKIT-8633RCZZ	BE	
5	JOURNAL NEAR END SENSOR	DKIT-8643RCZZ	BG	

4. Service tools

NO.	NAME	PARTS CODE	PRICE RANK
1	EXPANSION PWB FOR ER-A5IN AND ER-A5RS	CKOG-6708RCZZ	BU
2	SIO LOOP BACK CONECTOR	UKOG-6704RCZZ	AV
3	LOOP BACK CONECTOR FOR ER-A5IN AND ER-A5RS	UKOG-6705RCZZ	BC

5. Supplies

NO.	NAME	PARTS CODE	PRICE RANK	DESCRIPTION
1	ROLL PAPER	DPAPR1006CSZZ	AR	5rolls/pack
2	INK RIBBON	PRBN-6640RCZZ	AX	
3	INK FOR STAMP	UINK-1001CCZZ	AK	5cc
4	KEY SHEET	PSHEK6779RCZZ	AD	Programming character sheet
		PSHEK6778RCZZ	AH	Standard character sheet
		PSHEK6777RCZZ	AC	Blank character sheet

6. Options

For installation of the options, refer to the Installation Manual which is separately issued from this manual.

7. How to use service tools

7-1. SIO loop back connector: UKOG-6704RCZZ

- External view

Signal	Pin	
GND	1	N.C
$\overline{ER}$	2	
$\overline{DR}$	3	
RXD	4	
TXD	5	
$\overline{CD}$	6	
$\overline{RR}$	7	
$\overline{CS}$	8	
$\overline{RS}$	9	

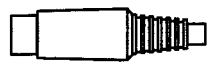


Fig. 7-1

- Purpose: Used for "SIO Test 1 (SIO loop back test)."
- Installation view:

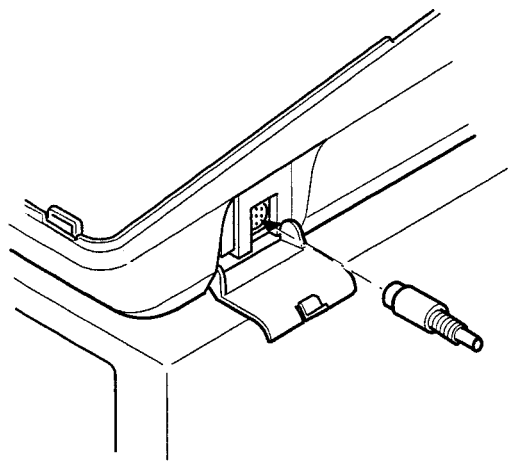


Fig. 7-2

- How to use: Connect the UKOG-6704RCZZ to the body and perform the following key operations:

  SRV mode: 117 → TL

7-2. Expansion PWB: CKOG-6708RCZZ

- External view

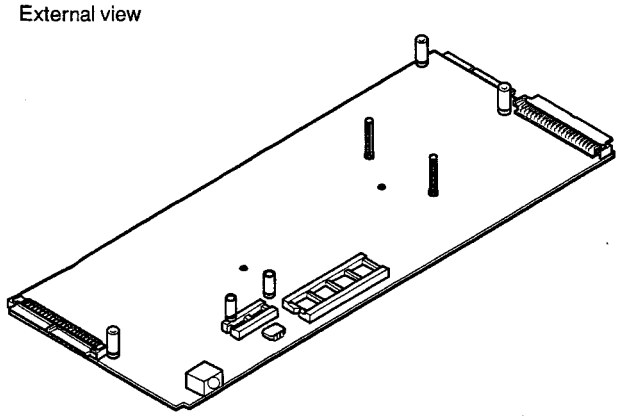


Fig. 7-3

Purpose 1: Used for servicing and repairing of options (such as the ER-A5IN and the ER-A5RS) which are connected with the main body option connector.

[Procedure 1]
Use an insulator base as that in Fig. 7-4 (shaded section) and perform servicing.

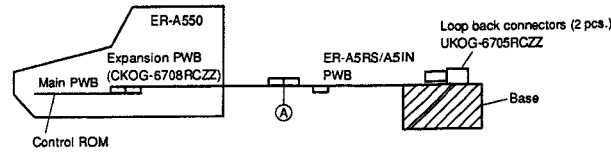


Fig. 7-4

To check the option I/F PWB from the solder side, connect the I/F PWB to OPTCN2. To check from the parts side, connect to OPTCN3.

(Note) The option I/F PWB should be held horizontally so that no excessive stress is applied to connecting section Ⓐ in Fig. 7-4.

[Procedure 2]

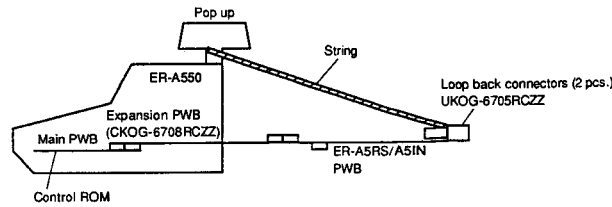


Fig. 7-5

As shown in Fig. 7-5, put a string between the pop up and the option PWB angle and adjust the length of the string so that the CKOG-6708RCZZ and the option PWB. Then perform servicing.

Purpose 2: The CKOG-6708RCZZ is equipped with the loop back connector for checking the ER-A5CB (SIO cable) cable operations.

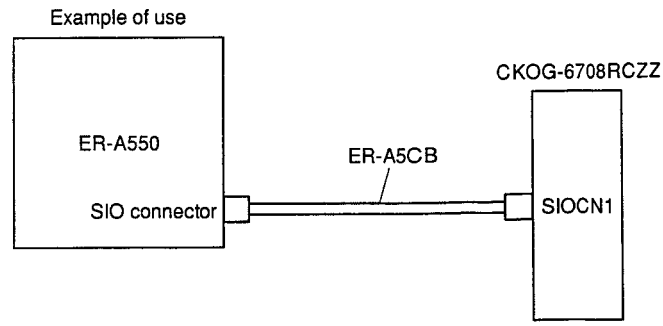


Fig. 7-6

Checking procedure

1) Connect the ER-A5CB between an ECR body and the CKOG-6708RCZZ SIOCN1. (The SIO functions of the ECR must be normal.)
2) Perform test function "117 (SIO loop back test)" and judge it normal or abnormal.

CHAPTER 3. SRV. RESET AND MASTER RESET

1. SRV. reset (Program Loop Reset)

Used to return the machine back to its operational state after a lock-up has occurred.

Procedure

- Method 1
  1) Turn off the AC switch.
  2) Set the mode switch to (SRV') position.
  3) Turn on the AC switch.
  4) Turn to (SRV) position from (SRV') position.
- Method 2
  1) Set the mode switch to PGM2 position.
  2) Turn off the AC switch.
  3) While holding down JOURNAL FEED key and RECEIPT FEED key, Turn on the AC switch.

Note: When disassembling and reassembling always power up using method 1 only. Method 2 will not reset the CKDCIII.

Note: SRV programming job#926-B must be set to "4" to allow PGM program loop reset.

2. Master reset (All memory clear)

There are two possible methods to perform a master reset.

- MRS-1

Used to clear all memory contents and return machine back to its initial settings. return keyboard back to default. for default keyboard layout.

Procedure

1) Turn off the AC switch.
2) Set the MODE switch to the (SRV') position.
3) Turn on the AC switch.
4) While holding down JOURNAL FEED key, turn to (SRV) position from (SRV') position.

- MRS-2

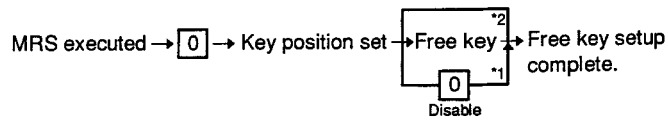
  Used to clear all memory and keyboard contents.
  This reset returns all programming back to defaults. The keyboard must be entered by hand.
  This reset is used if an application needs different keyboard layout other than that supplied by a normal MRS-1.

Procedure

1) Turn off the AC switch.
2) Set the MODE switch to the (SRV') position.
3) Turn on the AC switch.
4) While holding down JOURNAL FEED key and RECEIPT FEED key, turn to (SRV) position from (SRV') position.
5) Key position assignment:

* After the execution of MRS-2, only the RECEIPT FEED and JOURNAL FEED keys can remain effective on key assignment. Any key can be assigned on any key position on the main key-board.

[key setup procedure]



NOTES:

*1: When the 0 key is pressed, the key of the key number on display is disabled.

*2: Push the key on the position to be assigned. With this, the key of the key number on display is assigned to that key position.

*3: When relocating the keyboard, the PGM 1/2 use standard key layout.

Key number	Key name	Key number	Key name
1	Numeric key "0"	10	Numeric key "9"
2	Numeric key "1"	11	Numeric key "00"
3	Numeric key "2"	12	Numeric key "000"
4	Numeric key "3"	13	Decimal point key
5	Numeric key "4"	14	CL key
6	Numeric key "5"	15	⊗ key
7	Numeric key "6"	16	ST key
8	Numeric key "7"	17	TL key
9	Numeric key "8"		

CHAPTER 4 HARD WARE DESCRIPTION

1. Hard ware block diagram

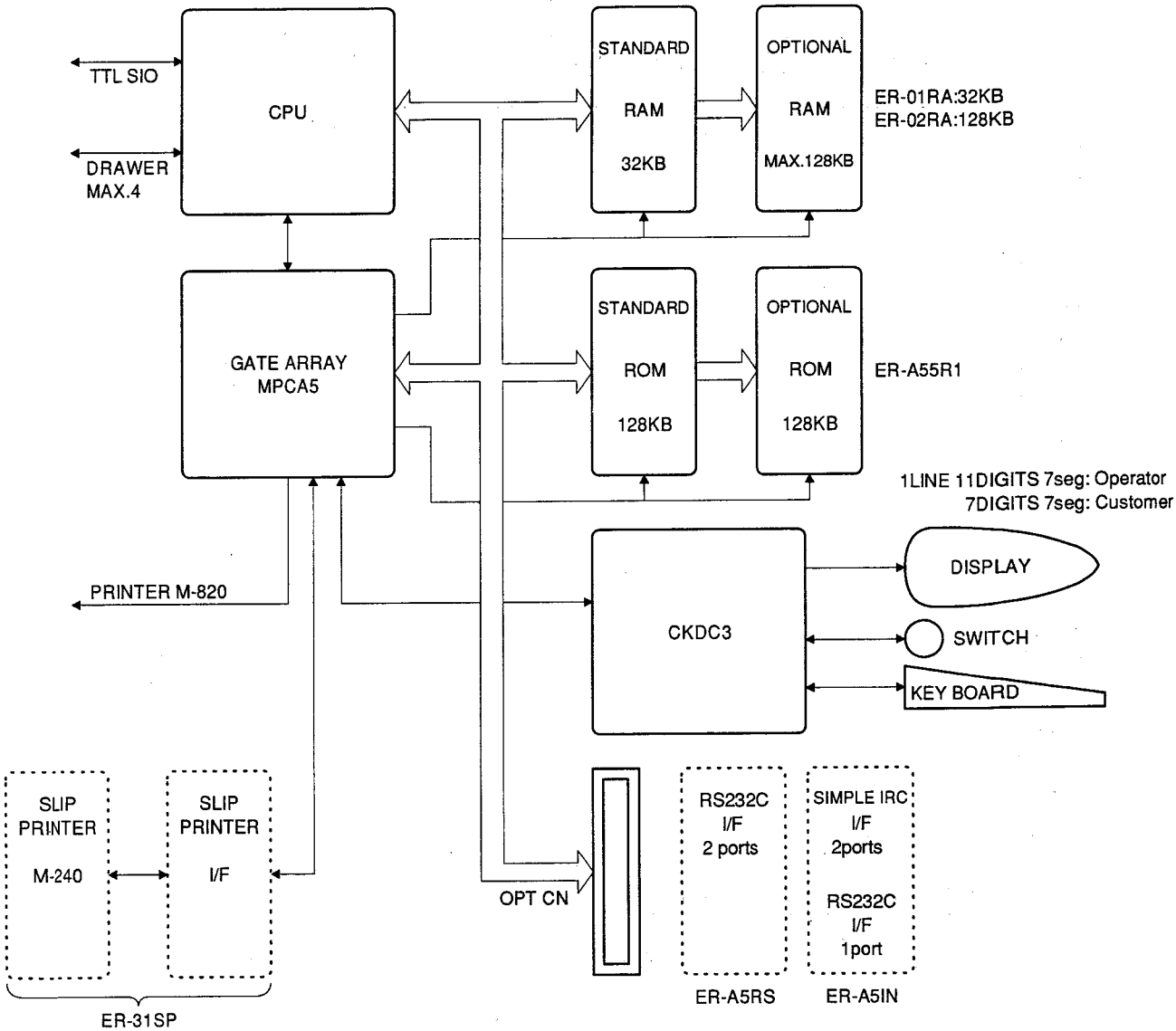
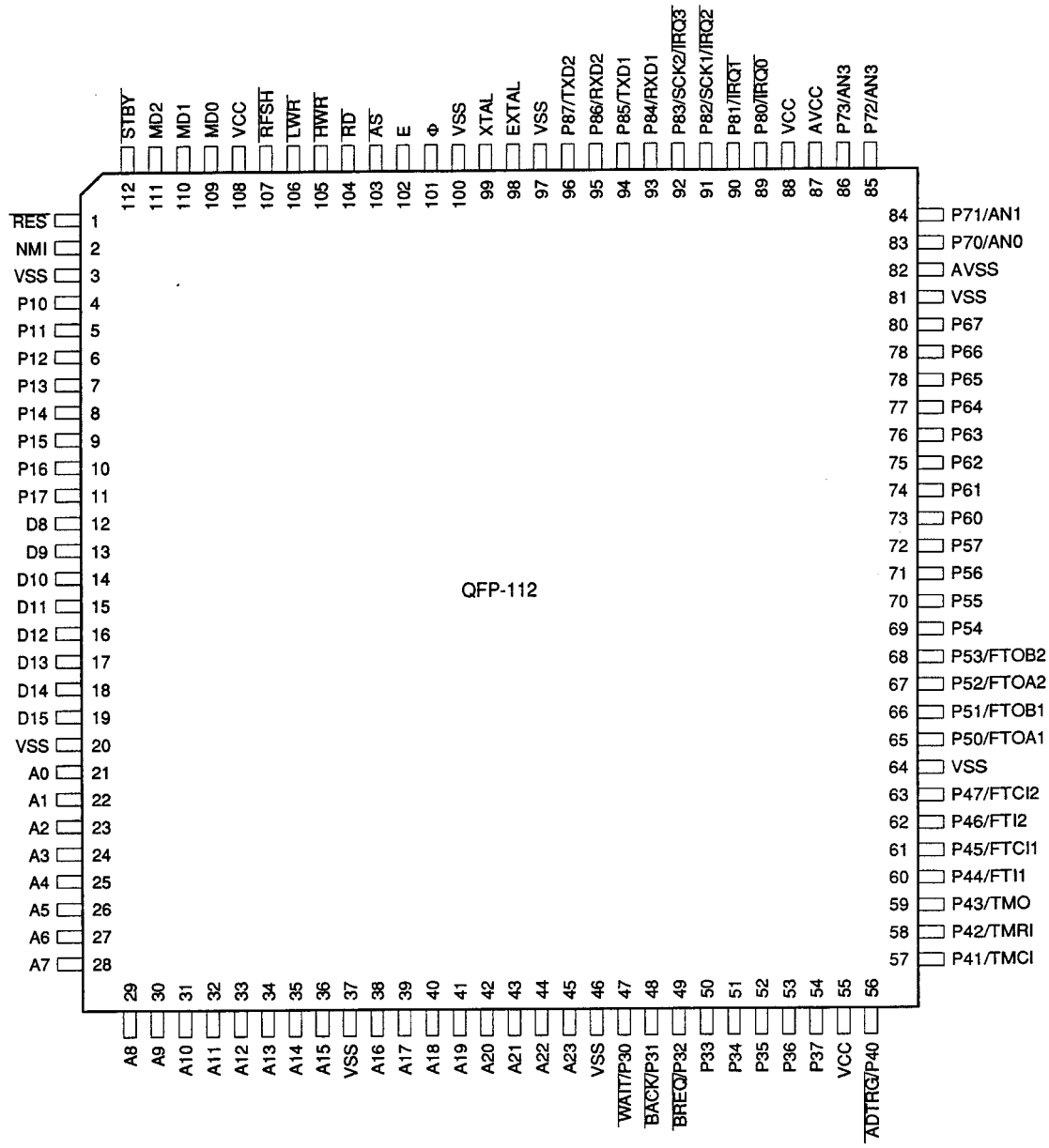


Fig. 1-1

2. Description of main LSI's

2-1. CPU (HD6415108FX)

1) Pin configuration



HD6415108FX pin configuration

Fig. 2-1

2) Block diagram

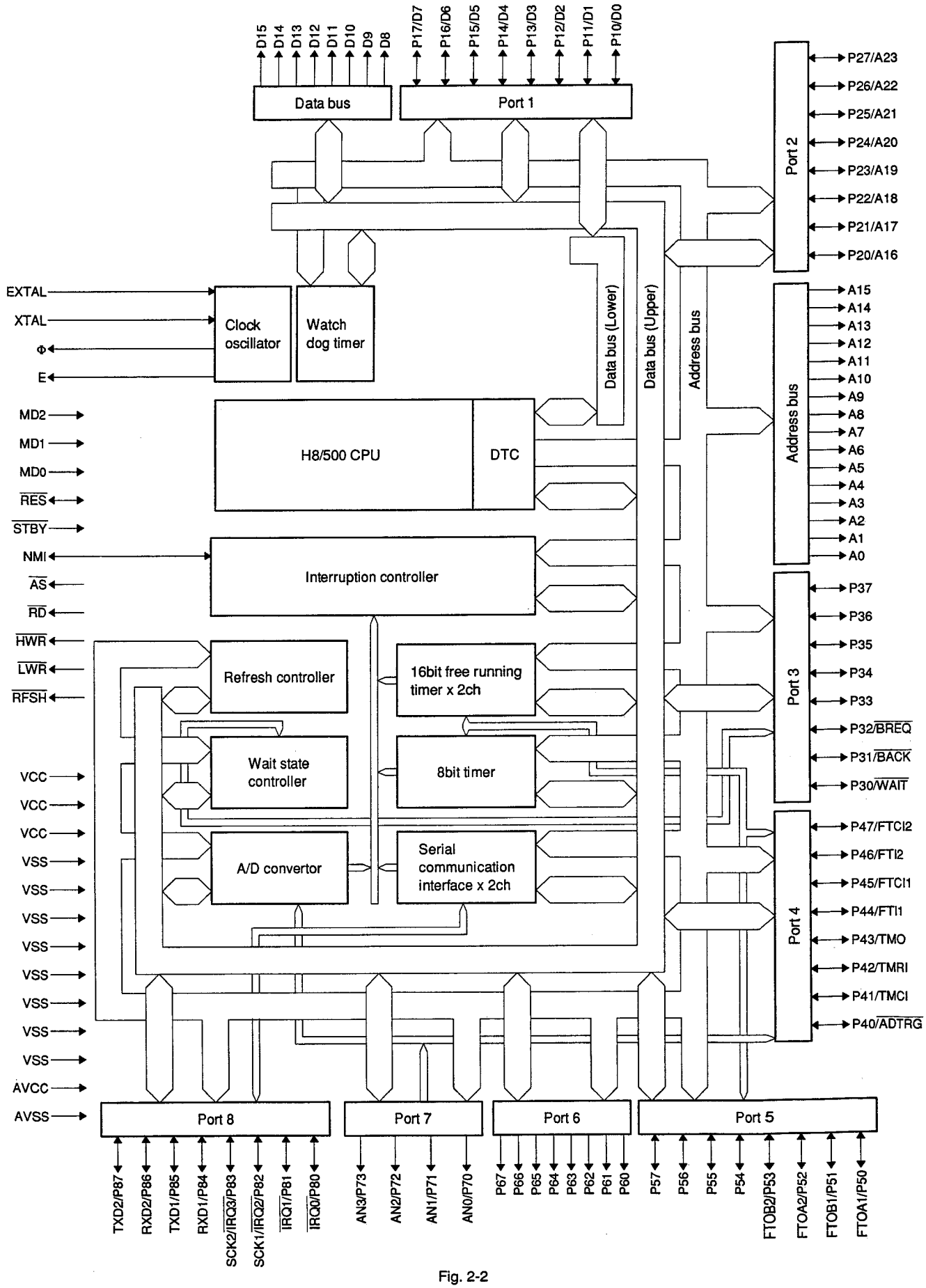


Fig. 2-2

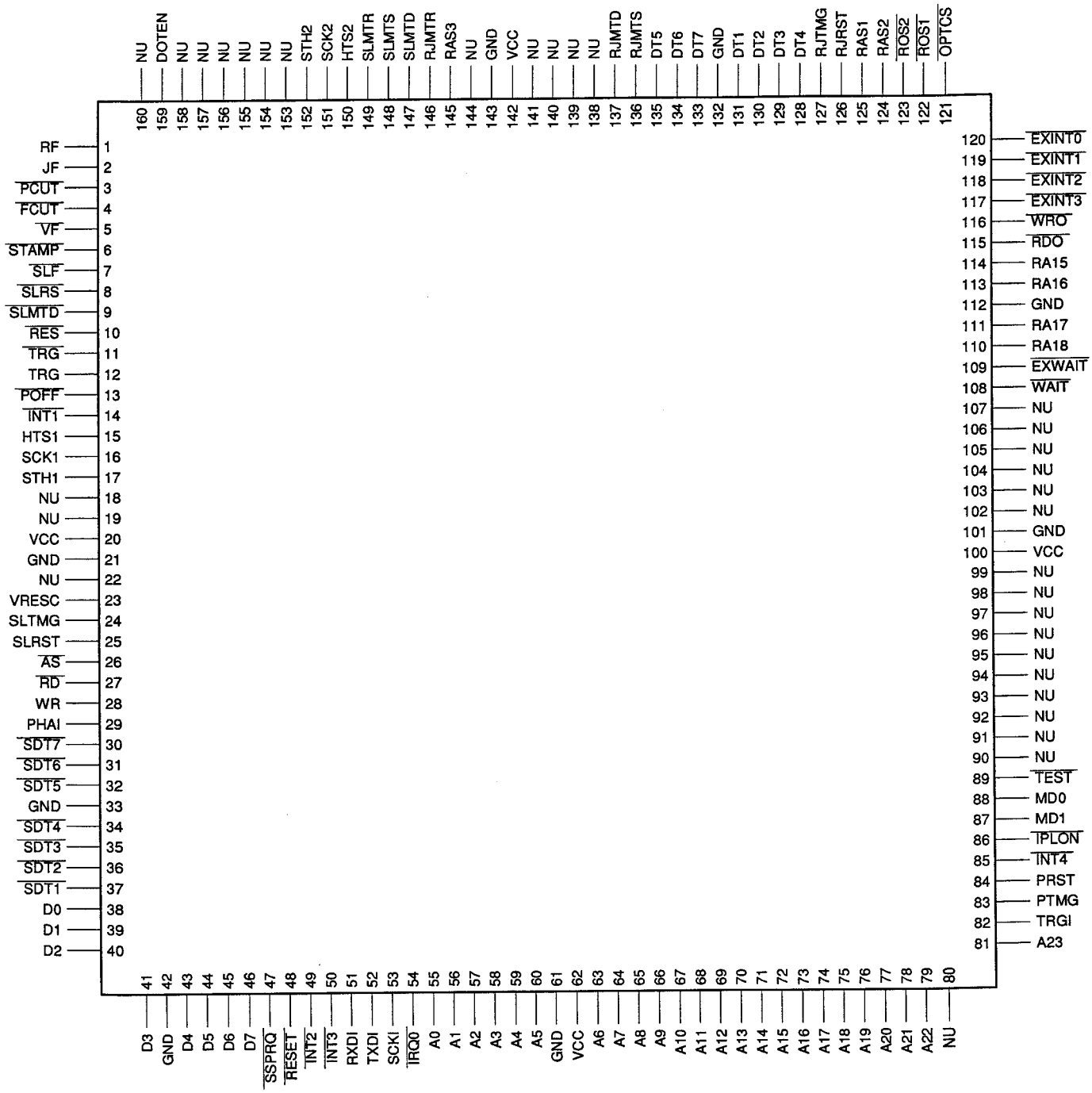
3) Pin description

Pin No.	Symbol	Signal name	In/ Out	Function
1	$\overline{RES}$	$\overline{RESET}$	I/O	Reset input
2	NMi	NMi	In	Non-maskable interrupt input for SSP interrupt input.
3	VSS	VSS	In	GND
4	P10	D0	In	Nu
5	P11	D1	In	Nu
6	P12	D2	In	Nu
7	P13	D3	In	Nu
8	P14	D4	In	Nu
9	P15	D5	In	Nu
10	P16	D6	In	Nu
11	P17	D7	In	Nu
12	D8	D0	I/O	Data bus
13	D9	D1	I/O	Data bus
14	D10	D2	I/O	Data bus
15	D11	D3	I/O	Data bus
16	D12	D4	I/O	Data bus
17	D13	D5	I/O	Data bus
18	D14	D6	I/O	Data bus
19	D15	D7	I/O	Data bus
20	VSS	VSS	In	GND
21	A0	A0	Out	Address bus
22	A1	A1	Out	Address bus
23	A2	A2	Out	Address bus
24	A3	A3	Out	Address bus
25	A4	A4	Out	Address bus
26	A5	A5	Out	Address bus
27	A6	A6	Out	Address bus
28	A7	A7	Out	Address bus
29	A8	A8	Out	Address bus
30	A9	A9	Out	Address bus
31	A10	A10	Out	Address bus
32	A11	A11	Out	Address bus
33	A12	A12	Out	Address bus
34	A13	A13	Out	Address bus
35	A14	A14	Out	Address bus
36	A15	A15	Out	Address bus
37	VSS	VSS	In	GND
38	A16	A16	Out	Address bus
39	A17	A17	Out	Address bus
40	A18	A18	Out	Address bus
41	A19	A19	Out	Address bus
42	A20	A20	Out	Address bus
43	A21	A21	Out	Address bus
44	A22	A22	Out	Address bus
45	A23	A23	Out	Address bus
46	VSS	VSS	In	GND
47	$\overline{WAIT}$	$\overline{WAIT}$	In	Wait signal
48	$\overline{BACK}$	$\overline{BACK}$	Out	Bus control request acknowledge
49	$\overline{BREQ}$	$\overline{BREQ}$	In	Bus control request
50	P33	DOPS	In	Drawer open signal
51	P34	$\overline{DR0}$	Out	Internal drawer open signal
52	P35	$\overline{DR1}$	Out	Option drawer No.1 open signal
53	P36	$\overline{DR2}$	Out	Option drawer No.2 open signal
54	P37	$\overline{DR3}$	Out	Option drawer No.3 open signal
55	VCC	VCC	In	+5V
56	P40	$\overline{IFV}$	In	Nu
57	P41	$\overline{PTMG}$	In	Printer (M-820) timing signal
58	P42	$\overline{TOF}$	In	Nu
59	P43	$\overline{BOF}$	In	Nu
60	P44	$\overline{PRST}$	In	Printer (M-820) reset signal
61	P45	$\overline{NEJ}$	In	Near end sensor journal side
62	P46	$\overline{SHEN}$	In	CKDC Interface shift enable signal
63	P47	$\overline{NER}$	In	Nu
64	VSS	VSS	In	+5V
65	P50	TRGI	Out	Dot pulse adjust signal
66	P51	$\overline{PSTOP}$	Out	Nu
67	P52	$\overline{CKDCR2}$	Out	Nu
68	P53	OPDS	In	Nu
69	P54	FVPON	Out	Nu
70	P55	FMRS	In	Nu
71	P56	$\overline{SLIPLMP}$	Out	Nu
72	P57	$\overline{STOP}$	Out	System reset output. Normally
73	P60	$\overline{ER}$	Out	SIO control signal (Equipment ready)
74	P61	$\overline{DR}$	In	SIO control signal (Data set ready)
75	P62	$\overline{CS}$	In	SIO control signal (Clear to send)
76	P63	$\overline{CD}$	In	SIO control signal (Carrier detect)
77	P64	$\overline{RR}$	Out	SIO control signal (Ready to receive)
78	P65	$\overline{RS}$	Out	SIO control signal (Request to send)
79	P66	$\overline{CI}$	In	Nu
80	P67	—	In	Nu
81	VSS	VSS	In	GND
82	AVSS	AVSS	In	Nu
83	P70	VPJ/VPT	In	Validation sensor journal/top
84	P71	VPR/VPB	In	Validation sensor receipt/bottom
85	P72	VPTEST	In	+24V test input
86	P73	$\overline{VPPS}$	In	Validation sense signal
87	AVCC	AVCC	In	Nu
88	VCC	VCC	In	+5V
89	P80	$\overline{IRQ0}$	In	Interrupt signal 0
90	P81	$\overline{IRQ1}$	In	Interrupt signal 1
91	P82	$\overline{IR02}$	In	Interrupt signal 2
92	P83	SCK	In	CKDC Interface sync shift clock
93	P84	RXD	In	SIO control signal (Receive data)

Pin No.	Symbol	Signal name	In/ Out	Function
94	P85	TXD	Out	SIO control signal (Transmit data)
95	P86	STH	In	CKDC Interface shift input data
96	P87	HTS	Out	CKDC Interface shift output data
97	VSS	VSS	In	GND
89	EXTAL	EXTAL	In	9.8304MHZ crystal oscillator connection
99	XTAL	XTAL	In	9.8304MHZ crystal oscillator connection
100	VSS	VSS	In	GND
101	ϕ	ϕ	Out	System clock
102	E	E	Out	Nu
103	$\overline{AS}$	$\overline{AS}$	Out	Address strobe
104	$\overline{RD}$	$\overline{RD}$	Out	Read
105	$\overline{HWR}$	$\overline{WR}$	Out	Write
106	$\overline{LWR}$	$\overline{LWR}$	Out	Nu
107	$\overline{RFSH}$	$\overline{RFSH}$	Out	Refresh cycle
108	VCC	VCC	In	+5V
109	MD0	MD0	In	+5V (MODE 3)
110	MD1	MD1	In	+5V (MODE 3)
111	MD2	MD2	In	GND
112	$\overline{STBY}$	$\overline{STBY}$	In	+5V (Nu)

2-2. G.A (MPCA5)

1) Pin configuration



GATE ARRAY (F258016PC)
MPCA5

Fig. 2-3

2) Block diagram

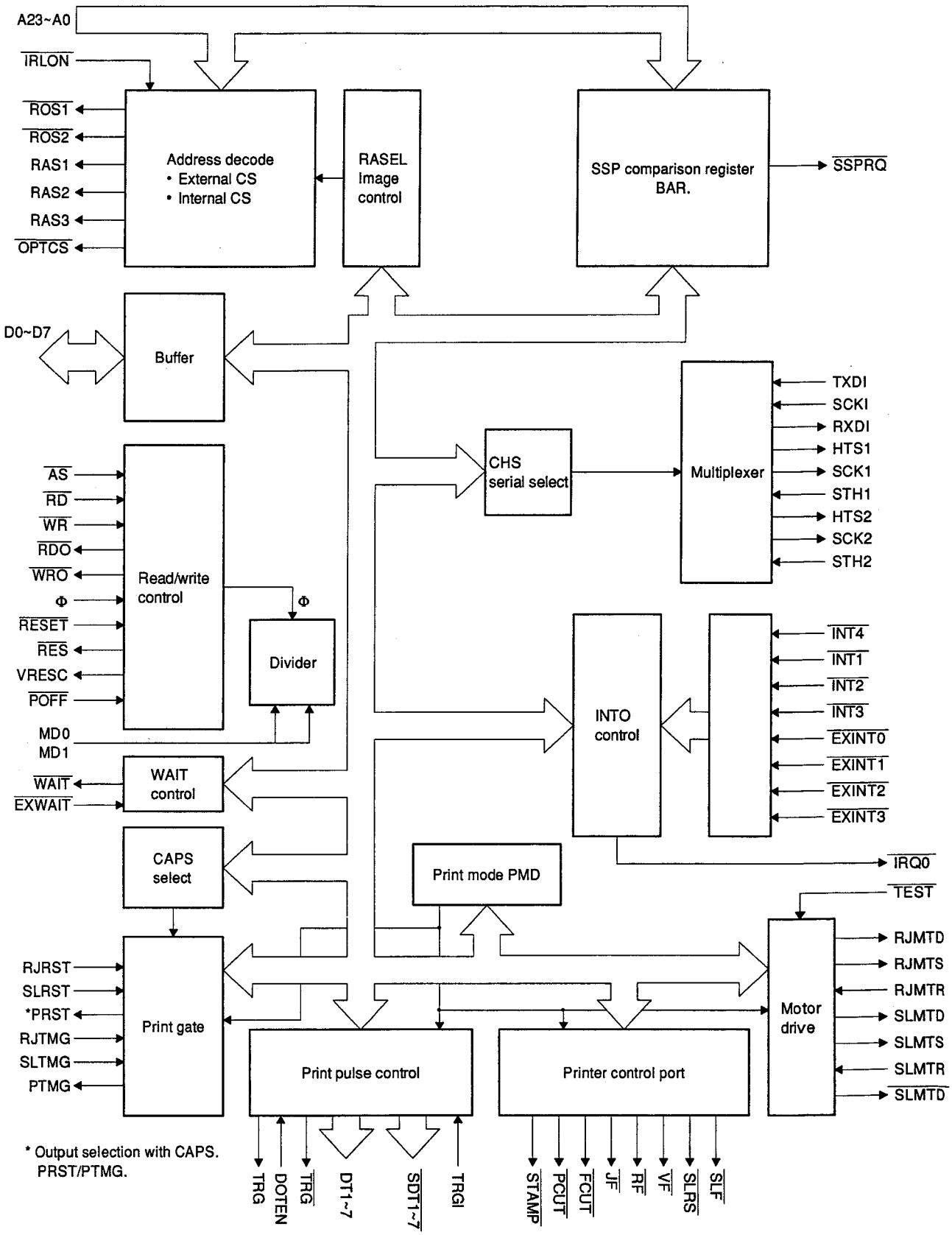


Fig. 2-4

3) Pin description

Pin No.	Signal name	In/ Out	Function
1	RF	Out	Receipt side paper feed solenoid
2	JF	Out	Journal side paper feed solenoid
3	$\overline{\text{PCUT}}$	Out	Printer (M-820) partial cut signal = Not used
4	$\overline{\text{FCUT}}$	Out	Printer (M-820) auto cut signal = Not used
5	$\overline{\text{VF}}$	Out	Multi line validation paper feed = Not used
6	$\overline{\text{STAMP}}$	Out	Printer (M-820) stamp signal
7	$\overline{\text{SLFS}}$	Out	Slip printer (M-240) paper feed singnal
8	$\overline{\text{SLRS}}$	Out	Slip printer (M-240) release signal
9	$\overline{\text{SLMTD}}$	Out	Nu
10	$\overline{\text{RES}}$	Out	Peripheral output reset
11	$\overline{\text{TRG}}$	Out	Dot head trigger signal (M-240)
12	TRG	Out	Dot head trigger signal (M-820)
13	$\overline{\text{POFF}}$	In	Interrupt input
14	$\overline{\text{INT1}}$	In	Interrupt signal (Key interrupt request)
15	HTS1	Out	8 bit serial port output
16	SCK1	Out	Serial port shift clock output
17	STH1	In	8 bit serial port input
18	—	—	Nu
19	—	—	Nu
20	VCC	—	+5V
21	GND	—	GND
22	—	—	Nu
23	VRESC	Out	Turns active when reset and power down is met
24	SLTMG	In	Slip printer timing signal
25	SLRST	In	Slip printer reset signal
26	$\overline{\text{AS}}$	In	Address strobe
27	$\overline{\text{RD}}$	In	Read strobe
28	$\overline{\text{WR}}$	In	Write strobe
29	PHAI	In	(ϕ) System clock
30	$\overline{\text{SDT7}}$	Out	Printhead drive signal (dot7) Nu
31	$\overline{\text{SDT6}}$	Out	Printhead drive signal (dot6) Nu
32	$\overline{\text{SDT5}}$	Out	Printhead drive signal (dot5) Nu
33	GND	—	GND
34	$\overline{\text{SDT4}}$	Out	Printhead drive signal (dot4) Nu
35	$\overline{\text{SDT3}}$	Out	Printhead drive signal (dot3) Nu
36	$\overline{\text{SDT2}}$	Out	Printhead drive signal (dot2) Nu
37	$\overline{\text{SDT1}}$	Out	Printhead drive signal (dot1) Nu
38	D0	I/O	Data bus
39	D1	I/O	Data bus
40	D2	I/O	Data bus
41	D3	I/O	Data bus
42	GND	—	GND
43	D4	I/0	Data bus
44	D5	I/0	Data bus
45	D6	I/0	Data bus
46	D7	I/0	Data bus
47	$\overline{\text{SPRQ}}$	Out	SSP interrupt request
48	$\overline{\text{RESET}}$	In	MPCA5 reset
49	$\overline{\text{INT2}}$	In	Interrupt signal (Nu)
50	$\overline{\text{INT3}}$	In	Interrupt signal (Nu)
51	RXDI	Out	8 bit serial port output to CPU
52	TXDI	In	8 bit serial port input from CPU
53	SCKI	In	Serial port shift clock input from CPU.
54	$\overline{\text{IRQ0}}$	Out	Interrupt request to CPU
55	A0	In	Address bus
56	A1	In	Address bus
57	A2	In	Address bus
58	A3	In	Address bus
59	A4	In	Address bus
60	A5	In	Address bus
61	GND	—	GND
62	VCC	—	+5V
63	A6	In	Address bus
64	A7	In	Address bus
65	A8	In	Address bus
66	A9	In	Address bus
67	A10	In	Address bus
68	A11	In	Address bus
69	A12	In	Address bus
70	A13	In	Address bus
71	A14	In	Address bus
72	A15	In	Address bus
73	A16	In	Address bus
74	A17	In	Address bus
75	A18	In	Address bus
76	A19	In	Address bus
77	A20	In	Address bus
78	A21	In	Address bus
79	A22	In	Address bus
80	—	—	Nu
81	A23	In	Address bus
82	TRGI	In	Dot pulse control/drive signal
83	$\overline{\text{PTMG}}$	Out	Printer timing signal
84	$\overline{\text{PRST}}$	Out	Printer reset signal
85	$\overline{\text{INT4}}$	In	Interrupt signal
86	$\overline{\text{IPLON}}$	In	Nu
87	MD1	In	Mode select input
88	MD0	In	Mode select input
89	$\overline{\text{TEST}}$	In	Nu
90	—	—	Nu
91	—	—	Nu
92	—	—	Nu
93	—	—	Nu
94	—	—	Nu
95	—	—	Nu
96	—	—	Nu
97	—	—	Nu
98	—	—	Nu
99	—	—	Nu
100	VCC	—	+5V
101	GND	—	GND
102	—	—	Nu
103	—	—	Nu
104	—	—	Nu
105	—	—	Nu

Pin No.	Signal name	In/ Out	Function	
106	—	—	Nu	
107	—	—	Nu	
108	$\overline{WAIT}$	Out	Wait request signal	
109	$\overline{EXWAIT}$	In	External wait control input signal	
110	RA18	Out	Nu	
111	RA17	Out	Nu	
112	GND	—	GND	
113	RA16	Out	Nu	
114	RA15	Out	Nu	
115	$\overline{RDO}$	Out	Expansion RD signal	Option
116	$\overline{WRO}$	Out	Expansion WR signal	
117	$\overline{EXINT3}$	In	Expansion interruption signal 3	Option
118	$\overline{EXINT2}$	In	Expansion interruption signal 2	
119	$\overline{EXINT1}$	In	Expansion interruption signal 1	
120	$\overline{EXINT0}$	In	Expansion interruption signal 0	
121	$\overline{OPTCS}$	Out	Chip select base signal for expansion option	
122	$\overline{ROS1}$	Out	ROM 1 chip select signal	
123	$\overline{ROS2}$	Out	ROM 2 chip select signal	
124	RAS2	Out	RAM 2 chip select signal	
125	RAS1	Out	RAM 1 ship select signal	
126	RJRST	In	M820 reset signal	
127	RJTMG	In	M820 timing signal	
128	DT4	Out	M820 dot signal	
129	DT3	Out	M820 dot signal	
130	DT2	Out	M820 dot signal	
131	DT1	Out	M820 dot signal	
132	GND	—	GND	
133	DT7	Out	M820 dot signal	
134	DT6	Out	M820 dot signal	
135	DT5	Out	M820 dot signal	
136	RJMTS	Out	M820 motor brake signal	
137	RJMTD	Out	M820 motor drive signal	
138	—	—	Nu	
139	—	—	Nu	
140	—	—	Nu	
141	—	—	Nu	
142	VCC	—	+5V	
143	GND	—	GND	
144	—	—	Nu	
145	RAS3	Out	Nu	
146	RJMTR	In	M820 motor lock detection signal	
147	SLMTD	In	Nu	
148	SLMTS	In	Nu	
149	SLMTR	In	GND	
150	HTS2	Out	Nu	
151	SCK2	Out	Nu	
152	STH2	In	Nu	
153	—	—	Nu	
154	—	—	Nu	
155	—	—	Nu	
156	—	—	Nu	
157	—	—	Nu	
158	—	—	Nu	
159	DOTEN	Out	Dot drive enable signal	
160	—	—	Nu	

2-3. CKDCIII (HD404728A20FS)

1) General description

The CKDCIII is a 4-bit microcomputer developed for the ER-A550 and provides functions to control the real-time clock, keys, and displays. The basic functions of the CKDCIII are shown below.

Keys: The CKDCIII is capable of controlling a maximum of 256 momentary keys. (Sharp 2-key rollover control)
Simultaneous scanning of key and switch
(When a key is scanned, the state of a mode and clerk switch is also buffered. The host can scan the state of switch together with the key entry data at the same time the key is scanned.)

Switches: Mode switch with 14 positions maximum
8-bit clerk (cashier) switch
2-bit feed switch
1-bit receipt on/off switch
1-bit option switch
4-bit general-purpose switch (1-bit is used for keyboard select)

Displays: 16-column dot display
12-column 7-segment display (column digit selectable)
All column blink controlled for the dot and 7-segment display decimal point and indicators
Programmable patterns for 7-segment display:
Four patterns
Internal driver for 7-segment display

Buzzer: Single tone control

Clock: Year, month, day of month, day of week, hour, minute

Alarm: Hour, minute

Interrupt request (event control):
Detection of key input, switch position change, alarm issue, and counter overflow

(2) Pin assignment

Pin No.	Port	I/O	RESET State	Standard I/O	Signal name	Notes PULL-UP –DOWN	
1	$R0_1$	I/O	H-Z	0	SB	SEG-B 100kΩ PULL-DOWN	
2	$R0_2$	I/O	H-Z	0	SC	SEG-C 100kΩ PULL-DOWN	
3	$R0_3$	I/O	H-Z	0	SD	SEG-D 100kΩ PULL-DOWN	
4	$R1_0$	I/O	H-Z	0	SE	SEG-E 100kΩ PULL-DOWN	
5	$R1_1$	I/O	H-Z	0	SF	SEG-F 100kΩ PULL-DOWN	
6	$R1_2$	I/O	H-Z	0	SG	SEG-G 100kΩ PULL-DOWN	
7	$R1_3$	I/O	H-Z	0	P0	NOT USE	
8	$R2_0$	I/O	H-Z	0	P0	NOT USE	
9	$R2_1$	I/O	H-Z	0	P1	NOT USE	
10	$R2_2$	I/O	H-Z	0	P2	DP 100kΩ PULL-DOWN	
11	$R2_3$	I/O	H-Z	0	P3	ID 100kΩ PULL-DOWN	
12	RA_0	I	I	I	$\overline{MODR}$	MODE RETURN from KEY BOARD UNIT	
13	RA_1	I	I	I	$\overline{CFSR}$	CLEARK, FEED, SWITCH: RETURN from KEYBOARD	
14	$R3_0$	I/O	H-Z	0	CGA0	NOT USE	
15	$R3_1$	I/O	H-Z	0	CGA1	NOT USE	
16	$R3_2$	I/O	H-Z	0	CGA2	NOT USE	
17	$R3_3$	I/O	H-Z	0	CGA3	NOT USE	
18	$R5_0$	I/O	I	0	ST0	ST0	Key SCAN timing signal (to KEY UNIT) Data signal of digit signal for dot display
19	$R5_1$	I/O	I	0	ST1	ST1	
20	$R5_2$	I/O	I	0	ST2	ST2	
21	$R5_3$	I/O	I	0	ST3	ST3	
22	$R6_0$/INT0	I/O	I	I	$\overline{POFF}$	$\overline{P\text{-}OFF}$ signal input	
23	$R6_1$/INT1	I/O	I	I	$\overline{STOP}$	$\overline{STOP}$ request signal from HOST CPU input	
24	$R6_2$/INT2	I/O	I	0	$\overline{SHEN}$	$\overline{SHEN}$ output (CPU)	
25	$R6_3$/INT3	I/O	I	0	$\overline{KRQ}$	$\overline{KRQ}$ output (To MPCAIV $\overline{INT1}$)	

Pin No.	Port	I/O	RESET State	Standard I/O	Signal name	Notes PULL-UP -DOWN
26	Vcc				VCKDC	Power supply
27	$R4_0$/SCK	I/O	I	I	$\overline{SCK}$	$\overline{SCK}$ input
28	$R4_1$/SI	I/O	I	I	HTS	HTS
29	$R4_2$/SO	I/O	I	O	STH	STH
30	$R4_3$/PWM	I/O	I	I		GND
31	$R7_0$/BUZZ	I/O	I	O	BUZZ	BUZZER
32	$R7_1$	I/O	I	O	$\overline{ENST}$	NOT USE
33	$R7_2$	I/O	I	O	$\overline{RESETS}$	SYSTEM RESET 10kΩ PULL-DOWN
34	$R7_3$	I/O	I	O	CGA7	NOT USE
35	$R8_0$	I/O	I	O	KEX0	KEY EXCHANGE0 OUTPUT to KEY UNIT
36	$R8_1$	I/O	I	O	KEX1	KEY EXCHANGE1 OUTPUT to KEY UNIT
37	$R9_0$	I	I	I	$\overline{KR0}$	KEY RETURN INPUT from KEY UNIT
38	$R9_1$	I	I	I	$\overline{KR1}$	KEY RETURN INPUT from KEY UNIT
39	$R9_2$	I	I	I	$\overline{KR2}$	KEY RETURN INPUT from KEY UNIT
40	$R9_3$	I	I	I	$\overline{KR3}$	KEY RETURN INPUT from KEY UNIT
41	RESET				CKDCR	CKDC III RESET 220Ω PULL-DOWN
42	OSC2					4.19MHz
43	OSC1					
44	GND					GND
45	CL1					32,768Hz
46	CL2					
47	TEST	I	I		VCKDC	
48	D0	I/O	H-Z	O	CGA4	NOT USE
49	D1	I/O	H-Z	O	CGA5	NOT USE
50	D2	I/O	H-Z	O	CGA6	NOT USE
51	D3	I/O	H-Z	I	—	GND (NOT USED)
52	D4	I/O	H-Z	O		NOT USE
53	D5	I/O	H-Z	O	G1	7 SEG DIG 1 100kΩ PULL-DOWN
54	D6	I/O	H-Z	O	G2	7 SEG DIG 2 100kΩ PULL-DOWN
55	D7	I/O	H-Z	O	G3	7 SEG DIG 3 100kΩ PULL-DOWN
56	D8	I/O	H-Z	O	G4	7 SEG DIG 4 100kΩ PULL-DOWN
57	D9	I/O	H-Z	O	G5	7SEG DIG 5 100kΩ PULL-DOWN
58	D10	I/O	H-Z	O	G6	7SEG DIG 6 100kΩ PULL-DOWN
59	D11	I/O	H-Z	O	G7	7SEG DIG 7 100kΩ PULL-DOWN
60	D12	I/O	H-Z	O	G8	7SEG DIG 8 100kΩ PULL-DOWN
61	D13	I/O	H-Z	O	G9	7SEG DIG 9 100kΩ PULL-DOWN
62	D14	I/O	H-Z	O	G10	7SEG DIG 10 100kΩ PULL-DOWN
63	D15	I/O	H-Z	O	G11	7SEG DIG 11 100kΩ PULL-DOWN
64	D00	I/O	H-Z	O	SA	SEG-A 100kΩ PULL-DOWN

NOTE 3: Pull-up/down in the table indicates that the lines concerned require external pull-up/down resistance.

3. Clock generator

1) CPU (HD6415108FX)

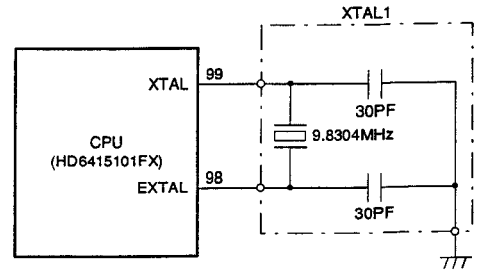


Fig. 3-1

Basic clock is supplied from a 9.8304MHz ceramic oscillator.
The CPU contains an oscillation circuit from which the basic clock is internally driven. If the CPU was not operating properly, the signal does not appear on this line in most cases.

2) HD404728A20FS CKDC-III oscillation circuit (Display-PWB)

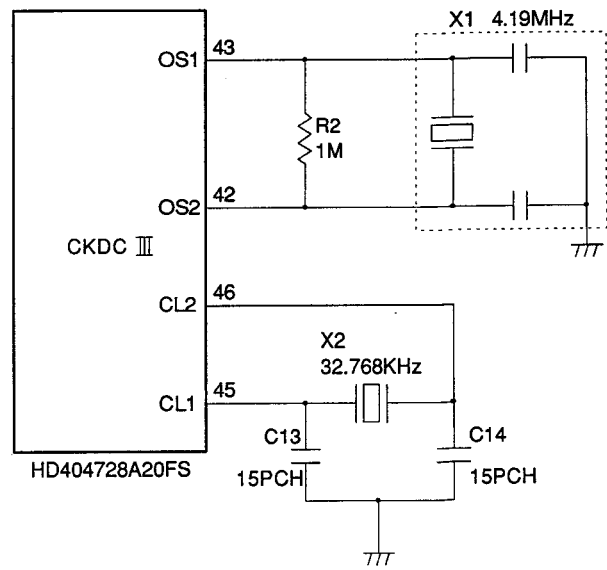


Fig. 3-2

Two oscillators are connected to the CKDC-III.
The main clock X1 generates 4.19MHz which is used during power on.
When power is turned off, the CKDC-III goes into the standby mode and the main clock stops.
The sub-clock X2 generates 32.768KHz which is primarily used to update the internal RTC (real time clock). During the standby mode, it keeps oscillating to update the clock and monitoring the power recovery.

4. Reset (POFF) circuit

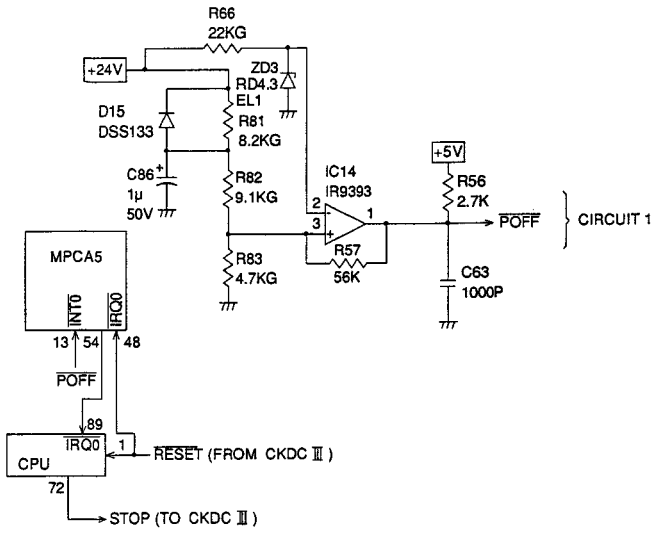


Fig. 4-1

In order to prevent memory loss at a time of power off and power supply failure of the ECR, the power supply condition is monitored at all times. When a power failure is met, the CPU suspends the execution of the current program and immediately executes the power-off program to save the data in the CPU registers in the external S-RAM with the signal $\overline{\text{STOP}}$ forced low to prepare for the power-off situation. The signal $\overline{\text{STOP}}$ is supplied to the CKDC-III as signal $\overline{\text{RESET}}$ to reset the devices.
This circuit monitors +24V supply voltage.
The voltage at the (–) pin of the comparator IR9393 is always maintained to 4.3V by means of the zener diode ZD3, while +24V supply voltage is divided through the resistors R81, R82, and R83, and is applied to the (+) pin. When normal +24V is in supply, 5.1V is supplied to the (+) pin, therefore, signal $\overline{\text{POFF}}$ is at a high level. When +24V supply voltage decreases due to a power off or any other reason, the voltage at the (+) pin also decreases. When +24V supply voltage drops, the voltage at the (+) pin drops below +4.3V, which causes $\overline{\text{POFF}}$ to go low, thus predicting the power-off situation.

5. Memory control

1) Memory map

① All range memory map

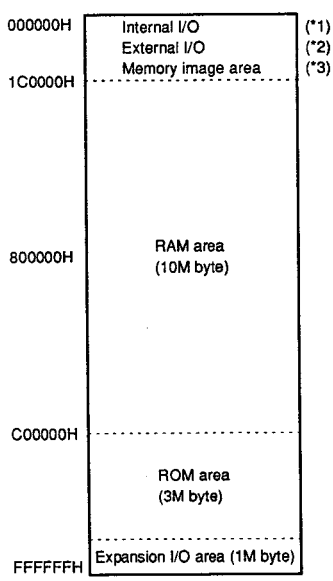


Fig. 5-1

(*1) "Internal I/O" means the registers in the H8/510.

(*2) "External I/O" means the base system I/O area to be addressed in page 0.

(*3) "Memory image area" means the lower 32KB of ROM area which is projected to 000000H ~ 007FFFH for allowing reset start and other vector addressing, or the lower 32KB of ROM area which is projected to 008000H ~ 00FE7FH for allowing 0 page addressing of work RAM area.

(*4) "Expansion I/O" means expansion I/O device area which isaddressed to area other than page 0.

② 0 page memory map

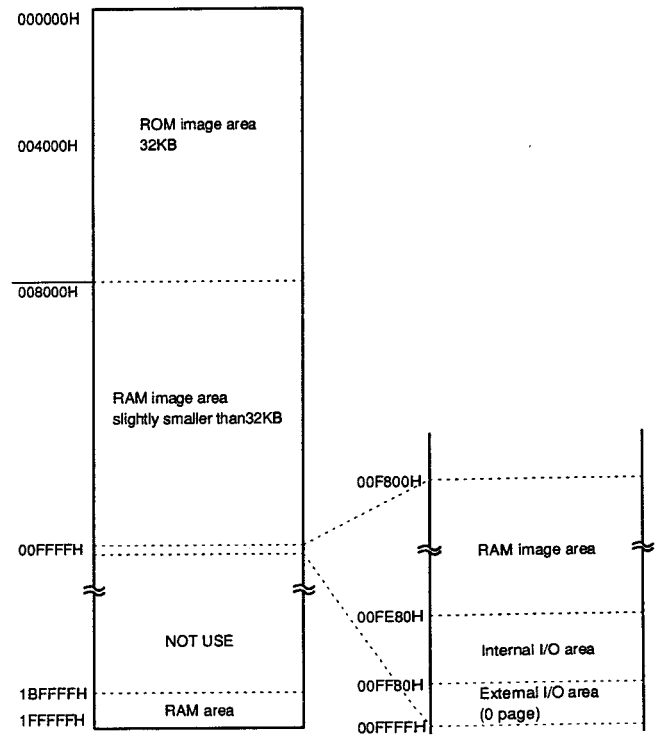


Fig. 5-2

- ROM image area: Image is formed in ROM area address C00000H C07FFFH. This area is identical to IPL ROM area which will be separately developed.
- RAM image area: Image is formed in RAM area address 1D8000H1DFE7FH. (*Note)

  * Note: Image can be formed in lower 32KB of RAS2.

③ **ROM area memory map**

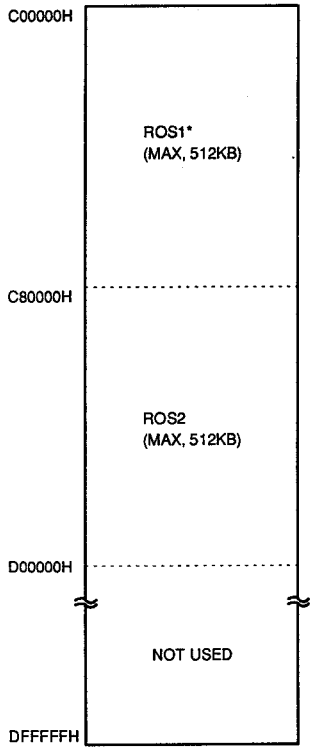


Fig. 5-3

These two decode signals decode 512KB space respectively and canbe used with max. 4MB ROM.

* Note: The lower 32KB of ROS1 signal is formed as OR of image area in 0page.

④ **RAM area memory map**

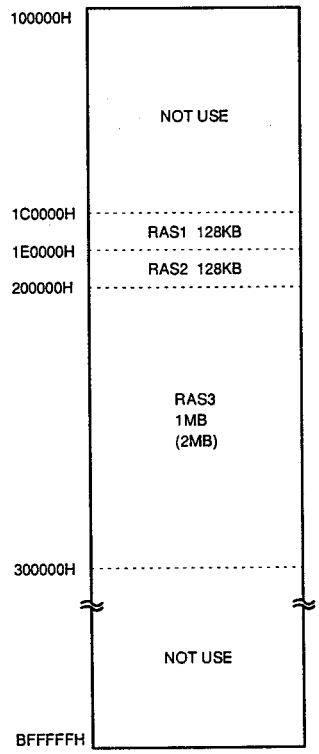


Fig. 5-4

In the three RAM chip select, the following address is decoded.

CS signal	Address
• RAS1	1C0000H~1DFFFFH (008000H~00FE7FH) * Note
• RAS2	1E0000H~1FFFFFH (008000H~00FE7FH) * Note
• RAS3	200000H~3FFFFFH

* Base signal is for 2M.

* Note: RAS1 signal is formed as OR in the image area of 0 page.j (Lower 32KB).
RAS2 signal is formed as OR in the image area of 0 page. (lower32KB).

⑤ **I/O area memory map**

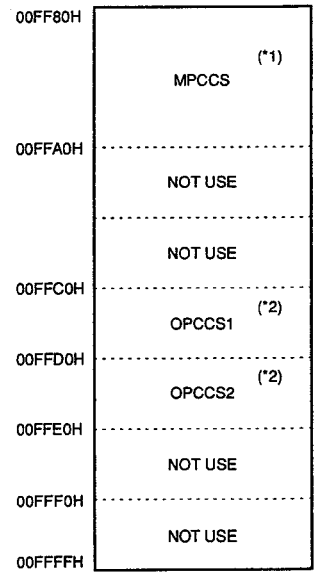


Fig. 5-5

* Note 1: MPCCS signal is the base signal for MPCA5 internal registerdecoding, and does not exist as an internal signal.

* Note 2: OPCCS1 and OPCCS2 signals are decoded in the OPC (optionperipheral controller) using the base signal OPTCS for optiondecoding. They does not exist as external signals.

2) Block diagram

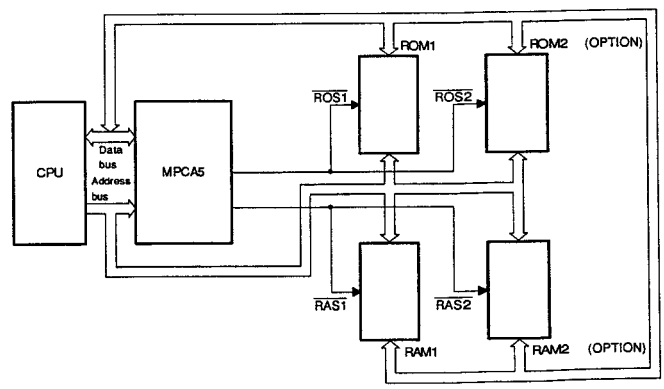


Fig. 5-6

① **ROM control**

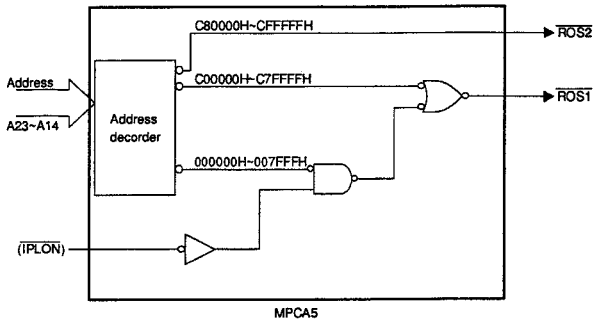


Fig. 5-7

IPLON: IPL board detection signal incorporated in the option slot. Note used in the ER-A550. (Not used)

Access is performed with two ROM chip select signals $\overline{ROS1}$ and $\overline{ROS2}$, which decode 512KB address area respectively to accessmax. 4MB ROM.

② **RAM control**

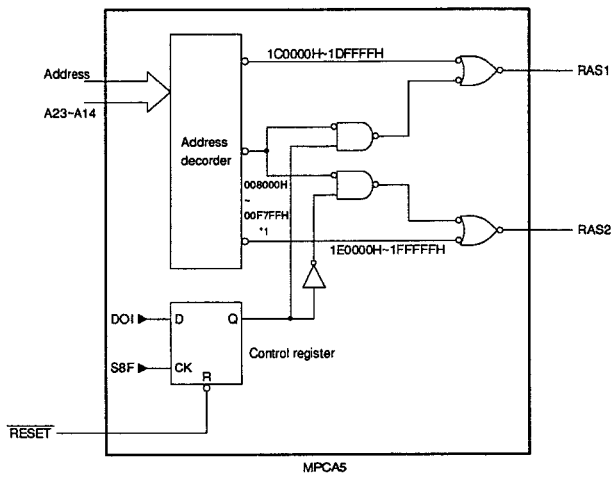


Fig. 5-8

Access is performed with two RAM chip select signals RAS1 andRAS2. The control register in MPCA5 allows selection of pageimage memory area. (RAS1 is selected for initializing.)

* : For 0 page image area, selection between RAS1 and RAS2 can bemade with the control register. The 0 page control registerperforms initializing at the timing of no stack processimmediately after resetting.

6. SSP circuit

1) Block diagram

This is the circuit employed to do the Special Service Preset(SSP).

(Block diagram)

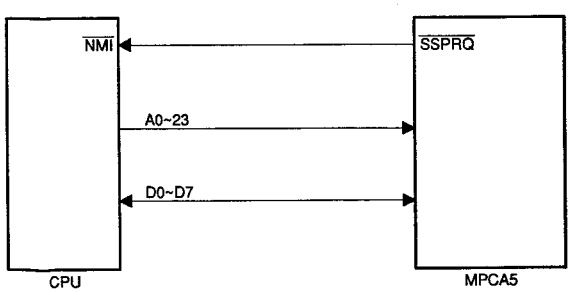


Fig. 6-1

(MPCA5 block diagram)

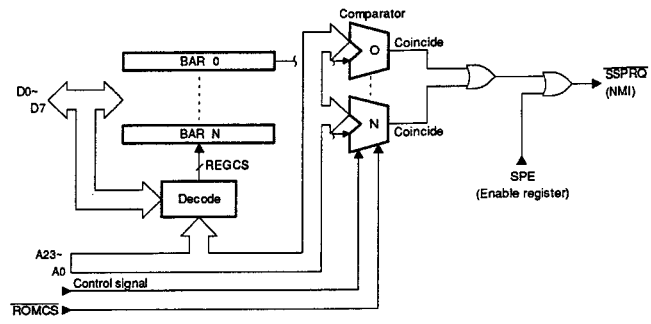


Fig. 6-2

As the address detection system, the brake address register comparison system is employed though the mapping system was employed in the conventional monitor RAM. The address registerlocated in MPCA is always compared with the system address bus to monitor and generate NMI signal at a synchronized timing and togo to NMI exception process.

In the exception process routine service routine, the entry address is checked to go to SSP sub routine.

Entry to the break address register (BAR) is performed through address FFFF00H or later decoded in MPCA5.

2) SSP register

The break address register (BAR) is accessed through direct address of FFFF00H~FFFFFFH. Entry number is 32 entry.

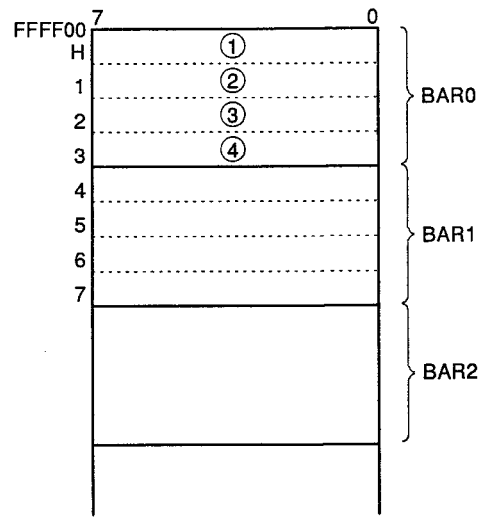
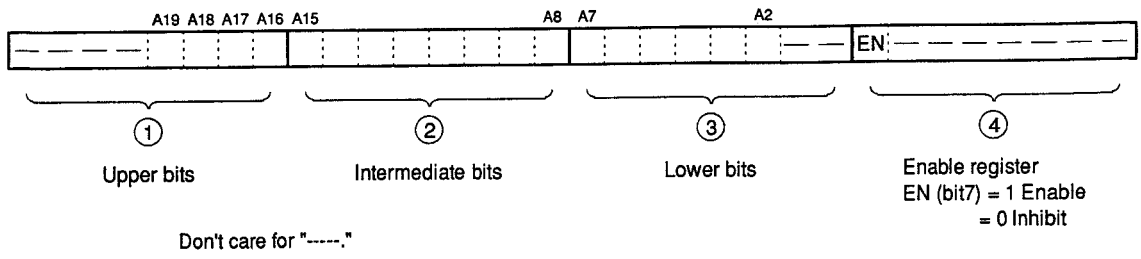


Fig. 6-3

Each BAR is composed of 4 byte address. Bit composition is as follows:



< BAR composition >

Fig. 6-4

④ is the enable register. The entry registers of the break address are assigned to ①, ②, and ③. Each bit of address corresponds to each bit position, writing to ①, ②, and ③ is performed without shifting. The corresponding area is 1MB space of ROS1 and ROS2.

3) SSP register access method

Access to SSP break address register is performed through the temporary register as shown below:

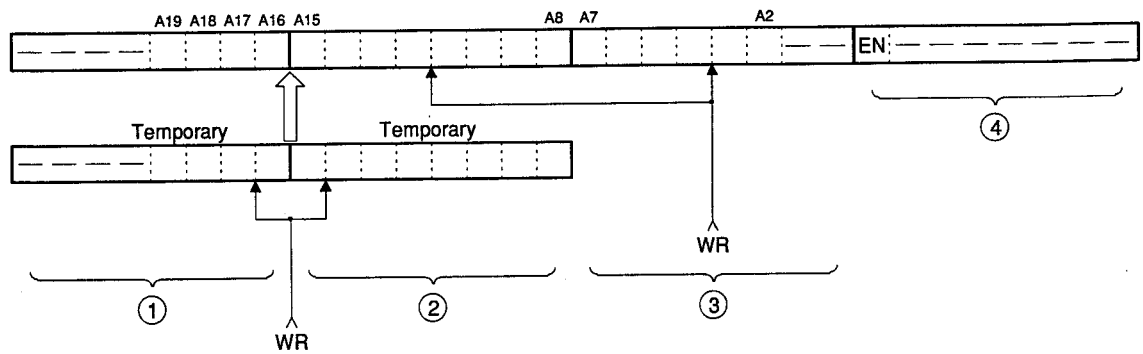


Fig. 6-5

Enable flags can be accessed individually.
Though enable register ④ can be accessed individually, writing to brake address registers ① and ② is performed at the same time as writing to brake address register ③ through the temporary register. Therefore, set ① and ② to temporary, then write into ③ at last.
Since the temporary register is commonly used by BAR sets, thefollowing register setting is performed after completion ofsetting of each break address register.

③ SSP control method

Access to the enable register and the brake address register is only possible when writing to them from the CPU.

bit 7	6	5	4	3	2	1	0	
0	0	0	CMP4	CMP3	CMP2	CMP1	CMP0	(FFFFFFH)

Information on which brake register the SSP brake is detected in is read as binary data by reading address FFFFFFH (*1).
Used in an expanded register.
Normally is a reserve bit. Whenreading, fixed to 0.

If there are 32 break registers, binary expression is made with the above 5 bits, and 0th is "00000_B" and 31st is "11111_B."

When detected simultaneously by two or more break registers, onewith the smaller BAR number is read as binary data.

The brake signals (NMI) and the above detection data (CMP0~4) areheld until the above detection data are read. So read should bemade in the NMI sub routine. (Clear by FFFFFFH read.)

* 1: FFFFFFH is not fulldecoded. (FFFF00H~FFFFFFH). Therefore,unnecessary read access in parentheses should not be performed.

7. PRINTER control circuit

1)Block diagram

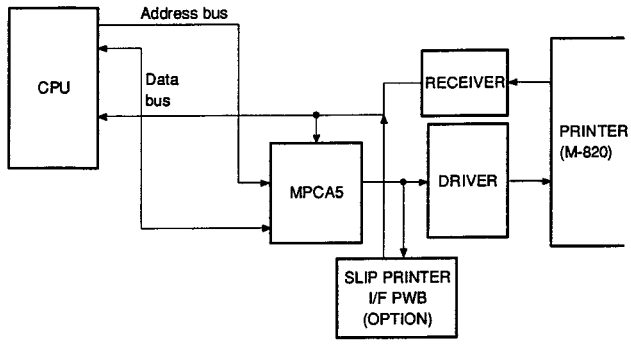


Fig. 7-1

2) General description of the printer controller

The M820 is used as the R/J printer of the body and the M240 is used as the slip printer. The printer mechanical timing control is made by the CPU through MPCA5.

3) Motor drive circuit

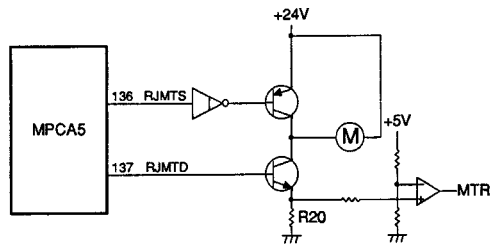
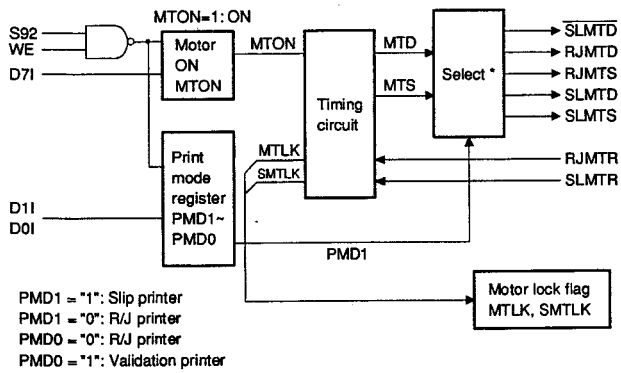


Fig. 7-2



MPCA5 internal circuit

Fig. 7-3

The printer motor ON/OFF control is performed with RJMTD as the drive signal and RJMTS as the brake signal. Motor lock detection is performed as follows:

Check by the hardware: The motor drive current flowing from the MTD transistor is checked across R20. When an overcurrent is detected, the MTR signal becomes HIGH to drive the MTS and MTD signals in the MPCA5 to HIGH impedance to stop conduction of the motor.

When the motor is stopped, the CPU timing pulse width is extended and the CPU judges it as motor lock.

CPU motor lock detection can be read out as internal register MTLK. Lock can be released by writing dummy data into MTLK as well as by conventional hardware reset.

Check by the CPU: When timing pulse from the printer is not generated for more than the specified time, the CPU judges it as motor lock, the MTON is reset (To High) and the motor is stopped.

4) Printhead mechanism

With the timing plus (TS) from the motor, current is applied to the dot wire drive coil to print.

- Discussion is given here to explain how a single dot wire is driven.

① When current is applied to a coil, the actuator moves towards the arrowhead (a) as the steel core is magnetized. The actuator makes connection with the wire, and the wire pushed out towards the platen.

② As the wire hits the platen with the ink ribbon and paper in-between, a dot is then printed.

③ When current is removed from the coil, the actuator and the wire return to their home positions by means of the actuator spring and wire return spring.

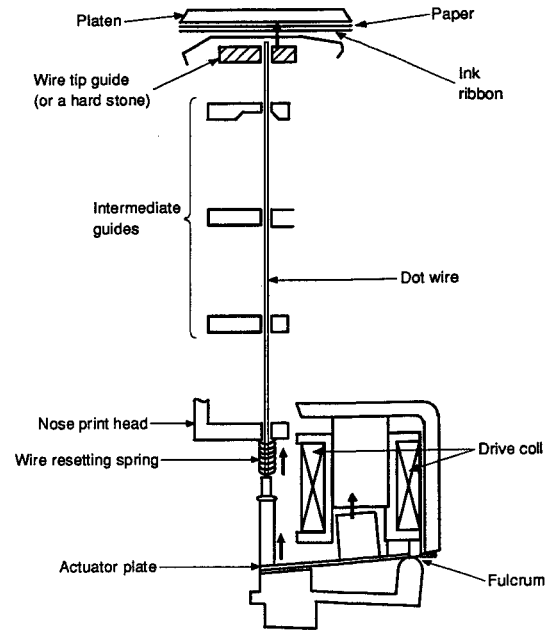
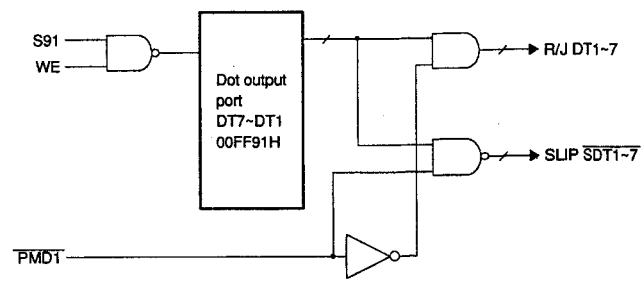


Fig. 7-4

5) Dot wire drive control circuit



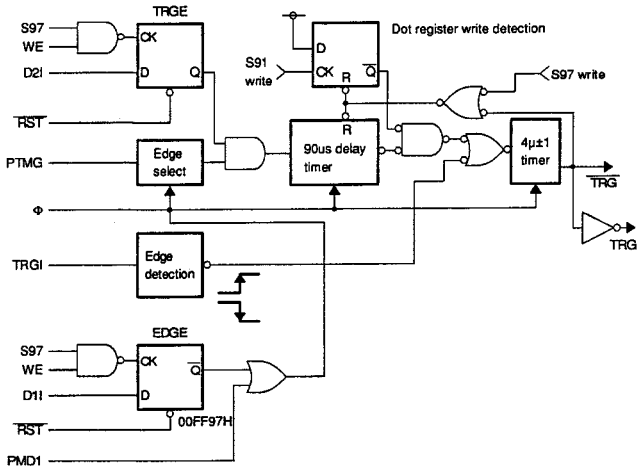
MPCA5 internal circuit

Fig. 7-5

When writing is made into address 00FF91H by the dot register in MPCA5, dot wire drive signals DT1~DT7 are formed.

When $\overline{PMD1}$ is low, the R/J printer is selected.

6) Print trigger generating circuit



MPCA5 internal circuit
Fig. 7-6

- Automatic trigger mode selection register (TRGE)
  TRGE = 1: Automatic trigger generation
  TRGE = 0: Trigger is generated at change edge of OCRA matchoutput.
  (Reset initial value = 0)
- Timing pulse active edge select register (EDGE)
  EDGE = 0: Falling edge
  EDGE = 1: Rising edge
  (Reset initial value = 0)

7) Dot solenoid drivers (solenoid 1 - 7)

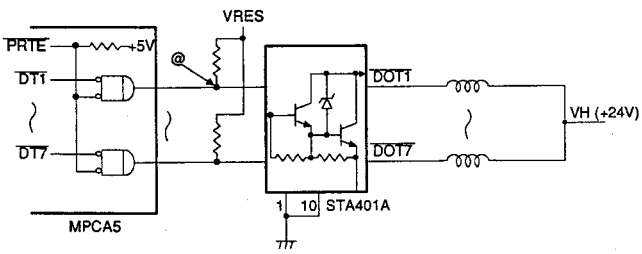


Fig. 7-7

Current to the dot solenoid is controlled in the following manner:

- VRES must be at a high level.
- At the same time $\overline{DTS1}$ is set low, $\overline{TRG}$ must be set low.
- $\overline{PRTE}$ is now set low. (MPCA5)
- PE must be set high level.
- The signal is turned high at point @, the magnet driver output is set low, and then VH flows through the magnet driver.
- The dot wire now protrudes to hit and print.

8) Sensor signal receive circuit

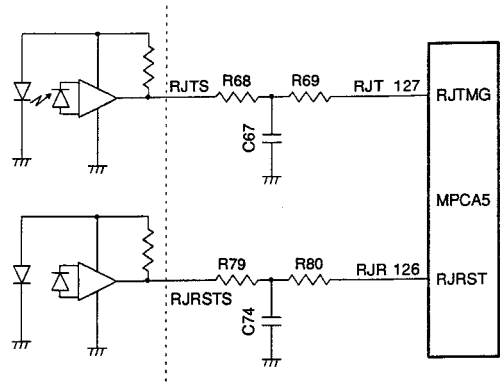
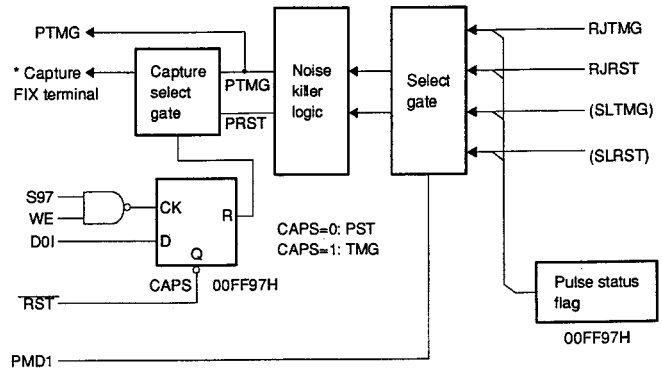


Fig. 7-8



** PRST/PTMG is in the same phase (non-reversion) of RJTMG/RJRST.

MPCA5 internal circuit
Fig. 7-9

The signal from the photocoupler within the printer is converted into TTL level and conveyed to the MPCA5.

9) Paper feed and stamp circuit

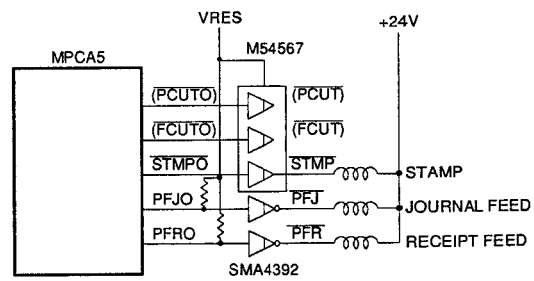


Fig. 7-10

The paper feed/stamp related signals issued from MPCA5 and pulled up by the VRES signal to prevent action when the power supply is not steady.

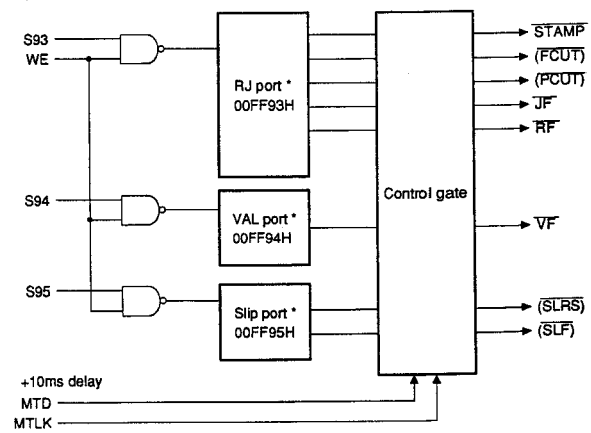


Fig. 7-11

Printer control signals are generated by writing each port address into the register address in PMCA5.

CAUTION

If fuse F1 should be blown, the dot head solenoid may be shorted. Be sure to check the head impedance and driver breakdown.

When fuse F1 is blown:

① Remove F1, and perform the service resetting. The set the mode switch to a position other than SRV and SRV' and turn off the power.

② Install fuse F1 (1.5A)and turn on the power.
If the fuse blows with the above operation, driver STA401A may be shorted.

③ Turn off the power.

④ Disconnect the printer cable from the printer. Measure impedance between the printer body connector pin 21 and the following pins:
18, 20, 24, 25, 28, 29, 30
The impedance must be 12.4 ~ 18Ω.
If impedance is outside the above range, the dot solenoid is bad. Replace the dot head unit.

8. Drawer drive circuit

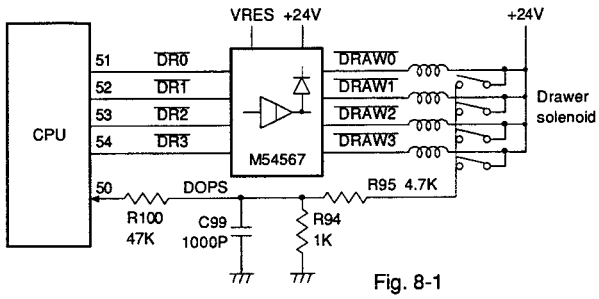
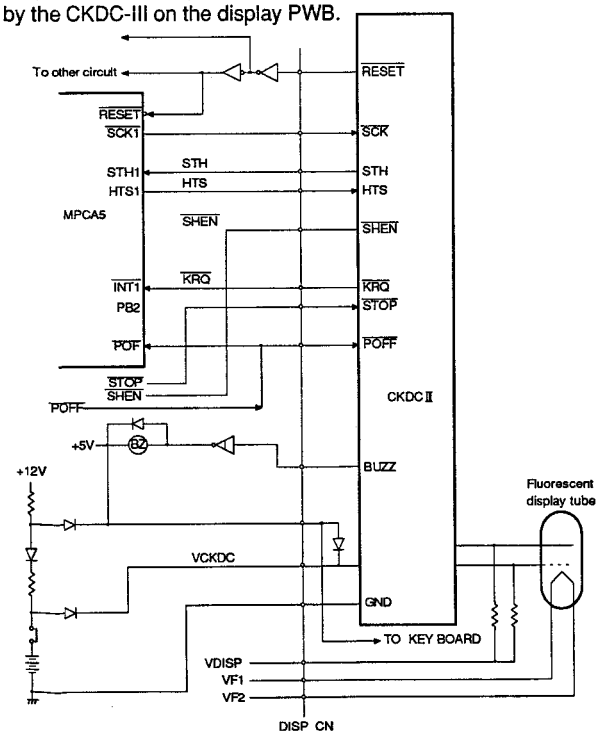


Fig. 8-1

The drawer is directly supported by the CPU. No action starts when the power supply is not steady as the output stage of the driver is pulled VP by VRES signal.
Drawer open and close is sensed with the microswitch provided in the drawer whose signal is level converted with R94 and R95 and directly read by the CPU.

9. Key, display, timer, buzzer controls

The keys, switches, displays, timer/calendar, and buzzer are controlled by the CKDC-III on the display PWB.



Block diagram
Fig. 9-1

1) Power on/off sequence

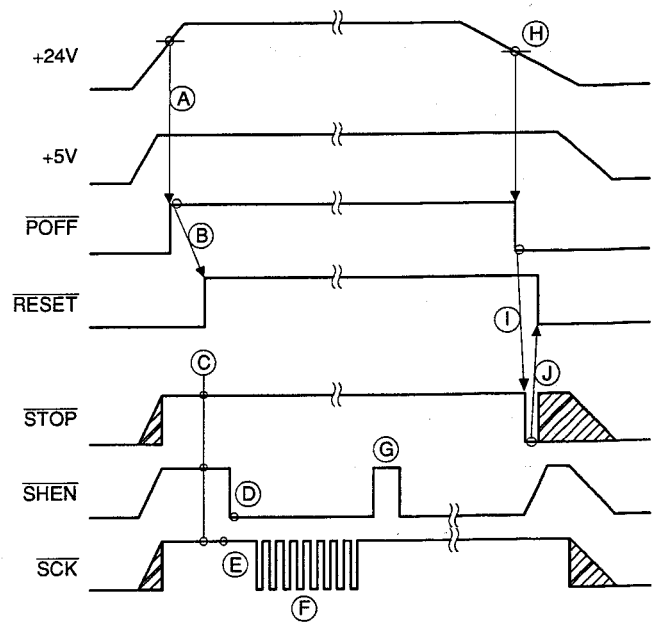


Fig. 9-2

Hatched area indicates logic unstable.

<At power on>

When +24V power rises, the signal POFF is forced high (A), by which time the +5V supply becomes stable. The CKDC-III monitors the state of POFF while updating the timer/calendar in the low power standby mode, and when the high state of POFF is detected, the system reset signal (RESET) is set high (B), by which time the output lines STOP and SCK of the CPU and MPCA5 have been initialized to high, respectively (C). Thereafter, the CKDC-III sets SHEN active (low) (D) to notify the CPU of the command/data communication ready state.
One byte data/command can be transferred with eight SCK pulses (F). When one byte has been transferred with eight SCK pulses, the CKDC-III sets SHEN high to initiate internal processing. After completion of the internal processing, when the next byte transfer becomes ready, the CKDC-III sets SHEN back to a low state to wait for the next byte transfer (G).
Thereafter, the SHEN and SCK timing described above is repeated to carry on the communication.

<At power off>

When +24V power drops, POFF goes low (H).
A low on the POFF line causes a low level interrupt request which is sent the IRQ0 pin of the CPU. Within a maximum of 10msec of the low level IRQ0 input, the CPU performs software processing necessary for power-off, after which the STOP output is set low (I).
When STOP goes low, the CKDC-III sets RESET low to reset the whole system (J). And, the +5V supply is held at 4.75V or higher voltage, after which the voltage drops to a level that the logic circuit does not operate.

2) Key and switch scanning

Strobes ST0 ~ ST3 are decoded on the keyboard by two 74LS138 3-to-8 decoders to generate 16 strobe signals of $\overline{S15}$ ~ $\overline{S0}$.
The key matrix consists of 16 strobe lines and 16 returns lines of $\overline{KR0A}$, $\overline{KR1A}$, $\overline{KR2A}$, $\overline{KR3A}$, $\overline{KR0B}$, $\overline{KR1B}$, $\overline{KR2B}$, and $\overline{KR3B}$.
To minimize interfacing lines between the CKDCIII and the keyboard unit, two multiplexers (74HC153) are used to multiplex signals by the timing controlled with the signals KEX0 and KEX1 which are sent to the CKDCIII on the return lines of $\overline{KR0}$ ~ $\overline{KR3}$.

Timing ST

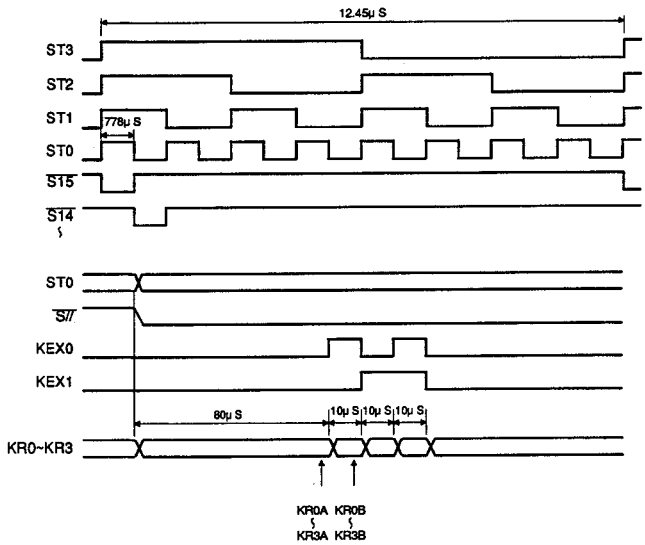


Fig. 9-3

The mode switch in provided with a special return line $\overline{MODR}$, apart from the above return lines.
In the same manner, the clerk, paper feed key (J/R), and receipt on/off switches use $\overline{CFSR}$ as the return line.

3) DISPLAY CONTROL

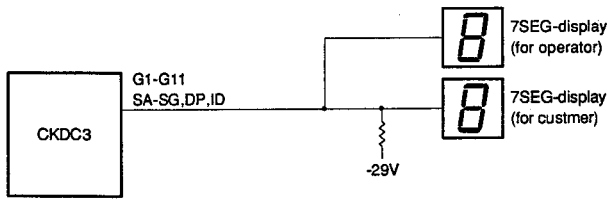


Fig. 9-4

CKDC3 directly drives the 7-segment display unit.
7 segment drive time chart
The display tube employs a grid blanking dynamic drive and operates in the following timing.

<7-segment display>

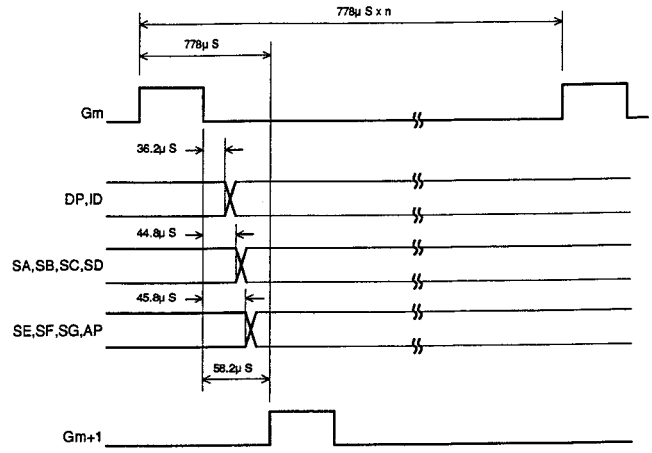


Fig. 9-5

10. Power supply circuit

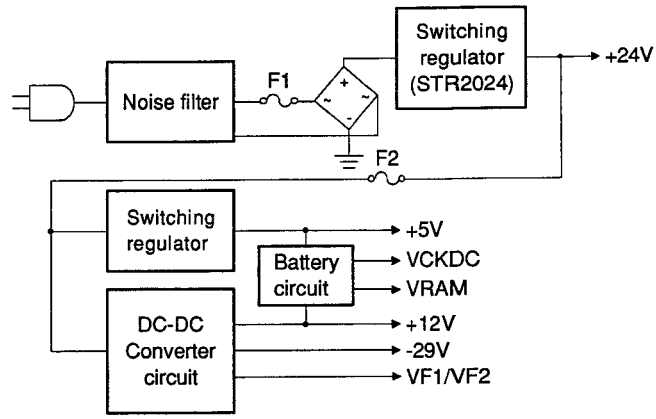


Fig. 10-1

+24V:	Printer, solenoid power
+5V:	VCC (Logic power)
+12V:	Battery charge, IN-LINE driver power
-29V:	Display tube power
VF1, VF2:	Display tube power (AC)
VRAM:	Battery back-uped power
VCKDC:	CKDC III Back-up power

For the DC-DC converter, refer to section 8 of cash register Basic manual.

11. Switching regulator circuit

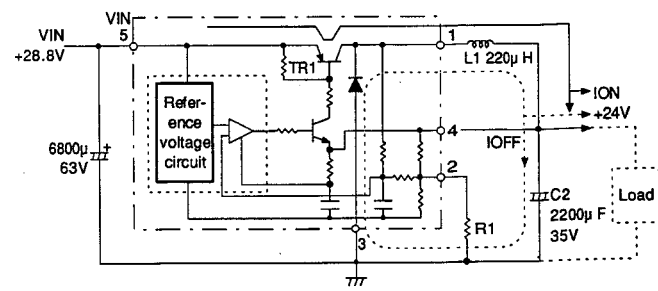


Fig. 11-1

By switching VIN (+28.8V) by the transistor TR1 within the STR2024, DC+26V supply is obtained through the LC network. Stable +24V is obtained by controlling on/off duty of TR1.

ION: Current when TR1 is on.
IOFF: Current when TR1 is off.

CHAPTER 5. TEST FUNCTION

1. General

1) This diagnostic program has been developed for diagnosing machine functions in the field. The program is contained with in the ER-A550.
The diagnostic program is stored in the external ROM which will be executed by the CPU (H8/510) which requires the following diagnostic operations:

a) Proper power supply voltages are mandatory for logic circuits (+5V, VRAM, VCKDC, POFF, 12V, +24V).

b) CPU input/output pins, CPU internal logic, CKDCIII, MPCA5, PRC, address decoder, address bus, data bus, and common ROM/RAM must be working properly.

2. Operational procedure

To start the diagnostic program, you must enter the following command.
3-digit test item number → [TL] key in the SRV mode.
The key assignment must be properly set and a part for ROM and RAM must be operating properly to go into this mode because the control jumps to the program area in the SRV mode. A master reset must be performed before operating the ECR for the first time. After any option is installed, a program reset is required. When the master reset or program reset is performed, be sure to check the printout on the journal paper.

Master reset:	Turn power on in the SRV' mode and change it to the SRV mode with the [JF] key pressed.
Journal print:	MASTER RESET ***
Program reset:	Turn power on in the SRV' mode and change it to the SRV mode.
Journal print:	PRG. RESET ***

3. Test command list

With the SRV mode and the following command entry, the test starts.

Code	Description
100	Display test-1
101	Key, cashier, and switch position code display
102	R/J printer (M-820) test-1
103	Slip printer (M-240) test-1
104	Keyboard test
105	Mode switch test
106	Validation sensor and near end sensor test
107	BOF, TOF and IFV test
108	Calendar oscillator test
109	SSP test
110	Drawer-1 open and sensor test
111	Drawer-2 open and sensor test
112	Drawer-3 open and sensor test
113	Drawer-4 open and sensor test
117	SIO test-1
120	Standard RAM test
130	Standard ROM test
150	R/J printer dot pulse width adjustment
200	Option RAM chip test
400	Option ROM test

[1] Display test-1

① Key operation
100 → [TL]

② Functional description
The following is displayed:

OPERATOR DISPLAY : 0. 1. 2. 3. 4. 5. 6. 7. 8. 9. -.

POP-UP DISPLAY : 4. 5. 6. 7. 8. 9. -.

③ Check the following items:

a) Check for proper activation of display elements.

b) Check for blur, uneven illumination, and partial omission.

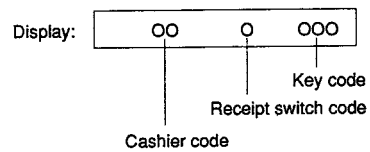
④ Test termination
Press any key. The test terminates with the test and message printed.

100
Test termination print

[2] Key, cashier, and switch position code display

① Key operation
101 → [TL]

② Functional description



Key, clerk, and receipt switch codes are displayed.

③ Check the following items:
Change key and switch positions for proper display activation.

cashier code:	Stay down cashier key	One hole cashier key
	00 (off state)	00 (off state)
	01 (Cashier 1)	01 (Cashier 1)
	02 (Cashier 2)	02 (Cashier 2)
	04 (Cashier 3)	03 (Cashier 3)
	08 (Cashier 4)	04 (Cashier 4)
		05 (Cashier 5)
		06 (Cashier 6)
Receipt switch code:	0 (on state) 1 (off state)	
Key code:	--- (simultaneous two key depression, invalid entry)	
	001 ~ 158	

NOTE: Refer to JOB#104, key soft code, for the key code. (Fig. 3-2.)

④ Test termination
Change the MODE switch position other than SRV position to terminate the test. The test termination message is printed.

101
Test termination print

[3] R/J printer (M-820) test-1

① Key operation
102 → [TL]

② Functional description
A letter "Z" is printed on all 21 digits of 5 lines and receipt issue.

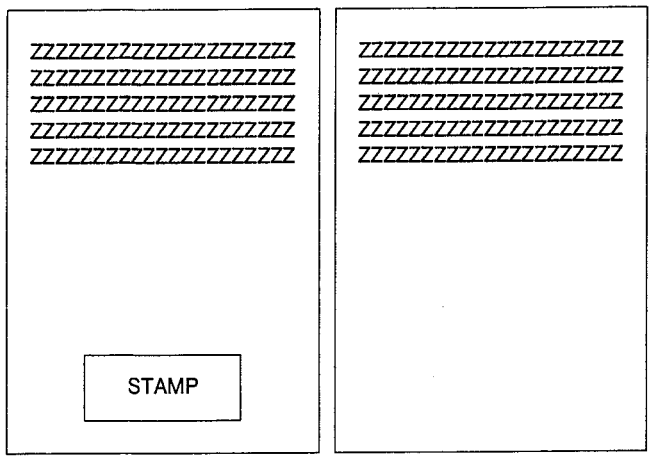
③ Check the following items:

a) Check to see that the print lines start at the same column.

b) Check to see that printing is done within the margins for both the receipt and the journal, specifically the right side of the receipt and the left side of the journal.

c) Check printing of the stamp.

<Print sample>



④ Test termination
The test automatically terminates without termination message print. No error print will be produced if an error was met.

[4] Slip printer (M-240) test-1

① Key operation
As slip must be set on the print table.
103 → [TL]

② Functional description
Regardless of paper setting, 35 digits of "Z" are printed on five lines, then the printer stops after releasing the paper.

③ Check the following items:
a) Print starting position must line up in the same column.
b) Check the print quality.
c) Make sure that the paper is released at the terminattion.

<Print sample>

ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ
ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ
ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ
ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ
ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ

④ Test termination
The test terminates automatically. If the paper release lever is not up, perform JOB#107 BTF, IFV test to release the paper.

The following error message will be printed when the ER-31SP printer or the slip printer interface board is not connected (IFV error).
Error print:

R/J printer:	E-----	103

[5] Keyboard test

① Key operation
104 → [TL]

② Functional description
Key actions of the standard version ER-A550 are tested.
Press keys on the keyboard in the order given in the figure 3-1. If the test has been successful, the test terminates with the printout showing correct action of every key. If an error has occured in the course of a test, an error message will be printed immediately upon occurrence of the error. When the test is interrupted, the normal test termination printout is not produced.

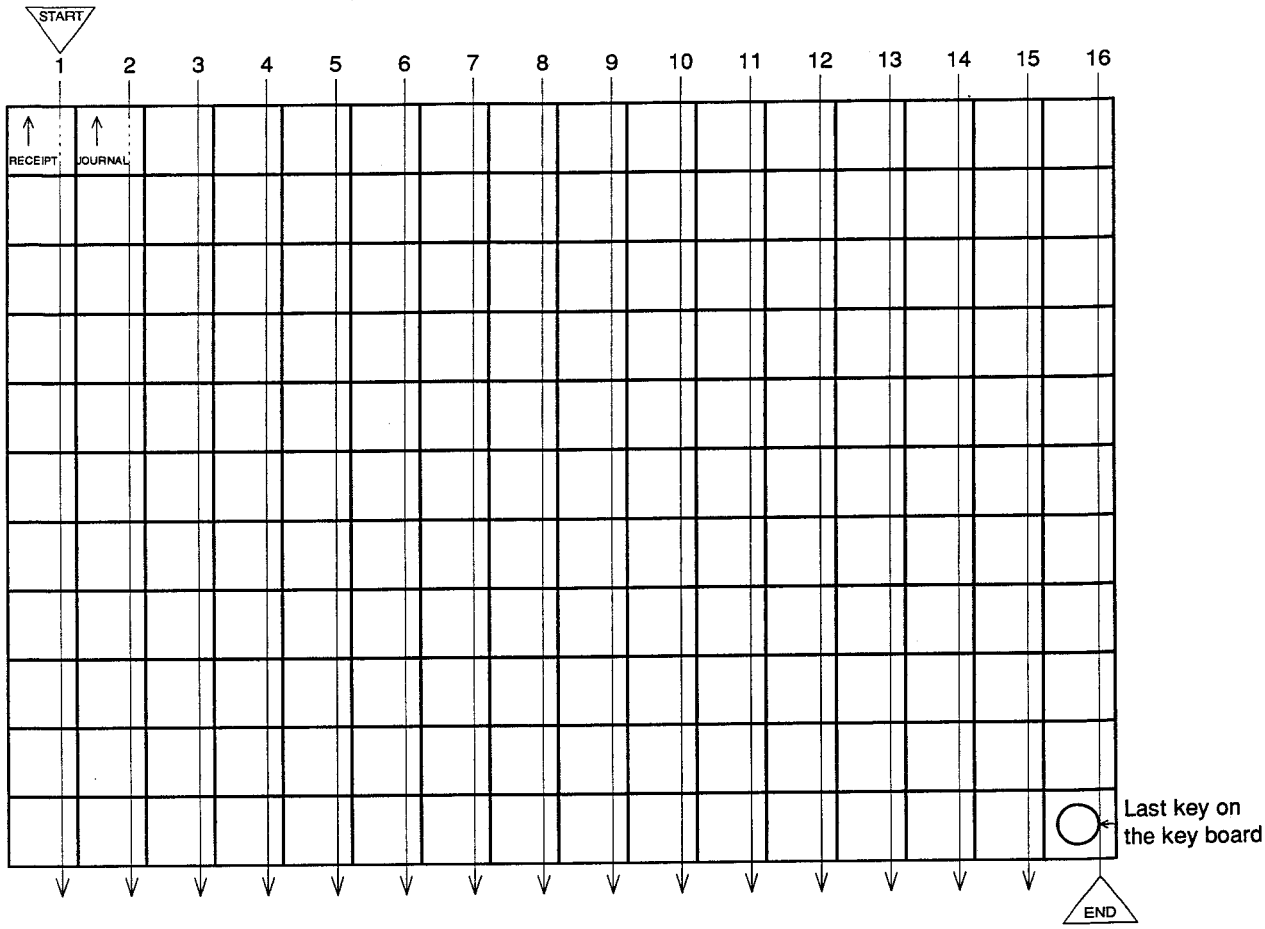
③ Check the termination print

④ Test termination
When the last key (see next page) is depressed, the test terminates with the termination printout.

	104	E--XXX	104
Test termination print		Error print	

XXX: Key code that caused the error

[ER-A550]



Note: The receipt feed key and the journal feed key are excluded from this test.

Fig. 3-1: TEST SEQUENSE

↑ RECEIPT	↑ JOURNAL	28	38	48	58	68	78	88	98	108	118	128	138	148	158
9	18	27	37	47	57	67	77	87	79	107	117	127	137	147	157
8	17	26	36	46	56	66	76	86	96	106	116	126	136	146	156
7	16	25	35	45	55	65	75	85	95	105	115	125	135	145	155
6	15	24	34	44	54	64	74	84	94	104	114	124	134	144	154
5	14	23	33	43	53	63	73	83	93	103	113	123	133	143	153
4	13	22	32	42	52	62	72	82	92	102	112	122	132	142	152
3	12	21	31	41	51	61	71	81	91	101	111	121	131	141	151
2	11	20	30	40	50	60	70	80	90	100	110	120	130	140	150
1	10	19	29	39	49	59	69	79	89	99	109	119	129	139	149

Fig. 3-2: KEY CODE TABLE

[5] Mode switch test

① Key operation
105 → [TL]

② Functional description
This test is applicable for checking of the MODE switch. The MODE switch must be changed as described below to do the test.
Initial state mode: SRV mode
Mode check
Change the MODE switch position in the order given below starting from the SRV position.

Display: [X] X: 0 ~ 7, E, F

Mode: SRV PGM2 PGM1 ⏻ OP X/Z REG
X : 0 1 2 (E) 3 4
SRV X2/Z2 X1/Z1 MGR
0 7 6 5
(X: E-intermediate position, F-multiple errors)

When the mode key settings in the sequence other than specified is met or when any key pushed, the program execution will terminate immediately upon occurrence, with the error printout produced, except for the mode switch in the middle position. To avoid this, the mode switch must be rotated correctly. Because nothing is interrogated until the mode key returns to the SRV position once after the switch has turned to the "X2/Z2" positions, it needs not to be rotated slowly.

③ Check the following items:
Check to see if the following are displayed and that the termination print is produced

④ Test termination
When the test has been completed according to the given procedure, the test automatically terminates with the termination message printed. To terminate the test in the middle of an operation, merely depress any key, then, the test will terminate with the error message printed. When an error was encountered, the test automatically terminates with the error message printed on the printer.

105	E---- 105
Test termination print	Error print (any key depression)

[6] Validation sensor and near end sensor test

The validation sensor and the near end sensor are optional units.

① Key operation
106 → [TL]

② Functional description
State of the validation and near end sensor is sensed and displayed.

③ Check the following items:
On and off actions of the validation and near end sensors are tested and their results are displayed.

Display: [x y z]

x: STATE OF THE VDST SENSOR
y: STATE OF THE VDSB SENSOR
z: STATE OF THE NES SENSOR

Display	X/Y/Z	Description
VDST	O	Validation card top (JOURNAL) not detected
	C	Validation card top (JOURNAL) detected
VDSB	O	Validation card bottom (RECEIPT) not detected
	C	Validation card bottom (RECEIPT) detected
NES	O	Journal side paper roll near end detected.
	C	Journal side paper roll near end not detected.

NOTE: "C" is always displayed when no sensor is used.

④ Test termination
Any key depression causes the test to terminate with the termination message on printout.

106
Test termination print

[7] BOF, TOF and IFV test

① Key operation
107 → [TL]

② Functional description
After releasing the paper, the state of BOF, TOF, and IFV sensor are sensed and displayed.

③ Check the following items:
BOF, TOF: Check the paper set condition.
IFV: Check the connection of the ER-31SP slip printer and slip printer interface.
Check the on and off actions.

Display: [YZ X]

X: State of IFV
Y: State of the BOF sensor
Z: State of the TOF sensor

Display	x/y	Description
IFV	O	Slip printer or slip printer interface not in connection
	C	Slip printer or slip printer interface not in connection
BOF	O	Slip paper not detected
	C	Slip paper detected
TOF	O	Slip paper not detected
	C	Slip paper detected

④ Test termination
Any key depression terminates the test with the termination print.

107
Test termination print

NOTE-1: The slip printer and the slip printer interface board must be connected for this test. Otherwise, if will result in

printer: E----- 107
Error print

[8] Calendar oscillator test

① Key operation
108 → [TL]
Functional description
This program is used to test the calendar oscillator function.

DISPLAY: [** - **] **: Present time

③ Check the following items:
i) Testing blinking "-". (500ms ON and OFF)

④ Test termination
Any key depression terminates the test with the termination print.

108
Test termination print

[9] SSP test

① Key operation
109 → TL

② Functional description
If an SSP is programmed, its contents are automatically checked and the result is printed.

③ Check the following items:
Check printing of the termination message.

④ Test termination
The test terminates automatically after printing the termination print.

109	E----- 109	F----- 109
Normal end print	Error print	SSP table full print (NOTE-3)

[10] Drawer open sensor test

① Key operation
110~113 → TL

② Functional description
The drawer indicated by the job number is opened to check the proper action.
Drawer opened: O indicated
Drawer closed: C indicated
110: Drawer-1: Standard drawer
111: Drawer-2: Option drawer
112: Drawer-3: Option drawer (No drawer connector)
113: Drawer-4: Option drawer (No drawer connector)

③ Check the following items:
a) Check opening of the specified drawer.
b) Check the display indication when the drawer is open and close.

④ Any key depression terminates the test with the termination print.

11X	
Test termination print	X: 0~3

[11] SIO test-1

① Key operation
117 → TL

② Functional description
The following two kinds of loopback tests are carried out using the special service tool (UKOG-6704RCZZ) to check the trans and receive data, ready, and not ready signals.
Test-1: Checks ER – DR, RS-CD and RR-CS
Test-2: Checks TXD – RXD

③ Check the following items:
Successful test results must be checked on the display and the termination message print.

④ Test termination

117	EX---- 117
Termination print	

X = 1: Non connect error
2: Verify error
3: Hardware error
4: P-OFF
5: Timer overflow error

[12] Standard RAM test

① Key operation
120 → TL

② Functional description
Perform the following check for the standard RAM 32KByte SRAM. The memory contents should not be changed before and after the check.

Perform the following processes for memory address to be checked (008000H-00FE7FH, and 1D8000H-1DFFFFH).
PASS1: Save memory data.

PASS2: Write data "0000H."
PASS3: Read and compare data "0000H," write data "5555H."
PASS4: Read and compare data "5555H," write data "AAAAH."
PASS5: Read and compare data "AAAAH."
PASS6: Restore the memory data.

If a comtare error occurs in the check sequence PASS1-PASS6, an error print is made. If no error occurs through all address, the check ends normally.

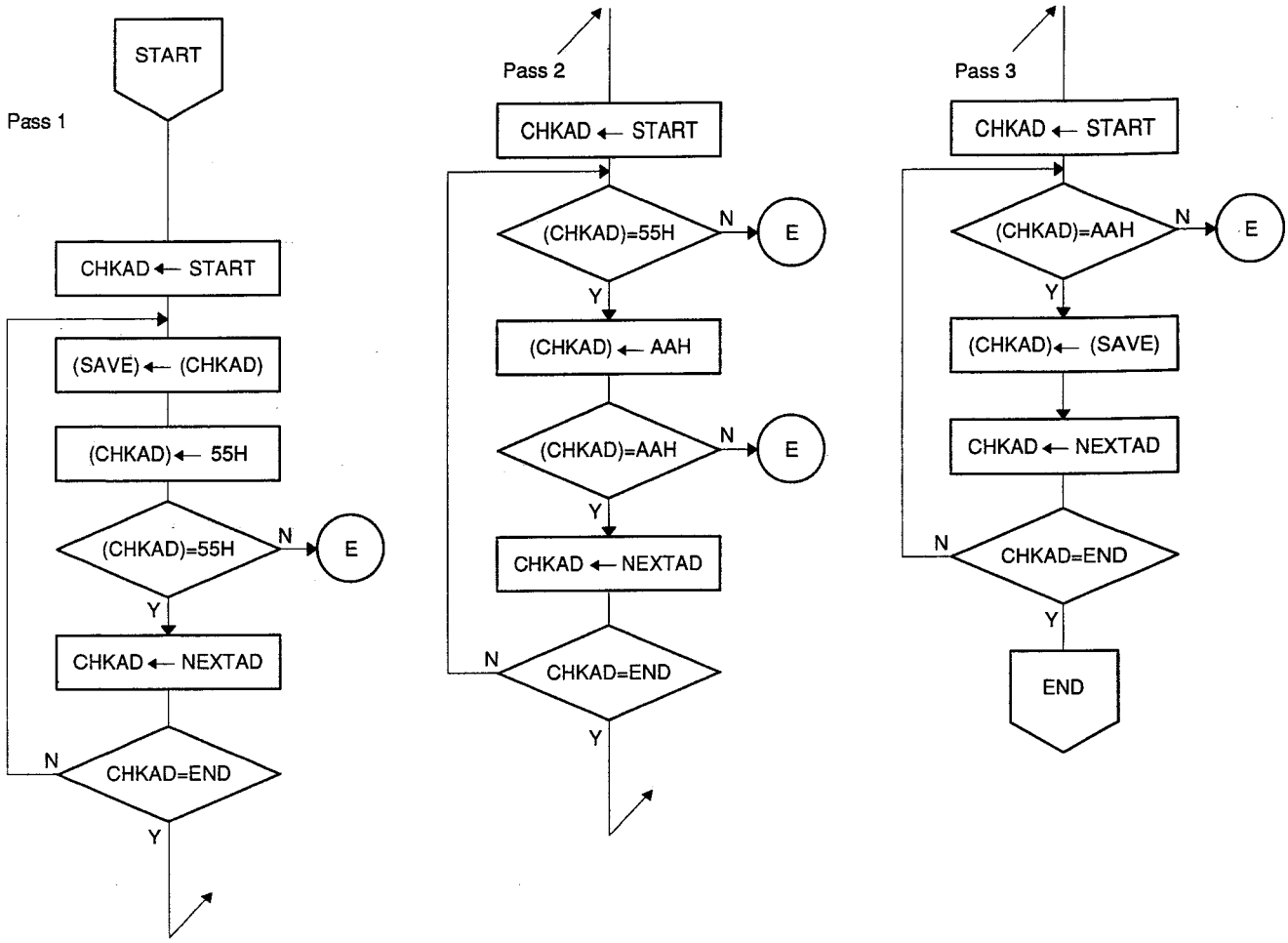
The following address check is performed further.
Check point address = 1D8000H
1D8001H
1D8002H
1D8008H
1D8010H
1D8020H
1D8040H
1D8080H
1D8100H
1D8200H
1D8400H
1D8800H

Test point read/write test
The following test is conducted to the test address of the bank 2.

Pass 1: After saving the data existing in the test address, the test data "55H" is written and verified (NOTE-1).

Pass 2: After verifying existence of the test data "55H" written in the pass 1 above (NOTE-2), the next test data "AAH" is written and verified (NOTE-1).

Pass 3: After verifying the test data "AAH" written in the pass 2 above (NOTE-2), the data previously saved is then restored to its address.
NOTE-1: Error printout 1 is produced when an error is met.
NOTE-2: Error printout 2 is produced when an error is met.



③ Check the following items:
Check the termination printout.

④ Test termination
The test terminates after printing the termination printout.
Termination printout:

Normal termination		120
Abnormal termination	E----	120

NOTES:

- When an error occurred, the test will resume after producing the error descriptive printout. No error printout will be produced for the RAM area to which an error was found before, even if an error occurred again in course of the test.

[13] Standard ROM test

① Key operation
130 → TL

② Functional description
A sumcheck is done for the standard ROM (Address hex C00000H thru CIFFFFH).

③ Check the following items:
Check the printout after the test.

④ Test termination
The test automatically terminates with termination message.

Normal termination print		130
	ROM1	27010XXXXX
Error termination print	E----	130
	ROM1	27010XXXXX

XXXXX: ROM version number

[14] R/J printer dot pulse width adjustment

The dot pulse width adjust circuit is provided to control the width of the current applied to the dot head of the printer KI-OB6754RCZZ, according to a supply voltage fluctuation.
When the circuit is changed with a new one for such as a repair work, the dot pulse width needs to be adjusted using the 200K pot VR2.

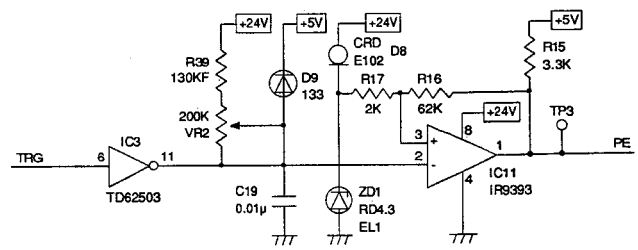


Fig. 3-3

Dot pulse adjusting method

1. Turn power on.
2. Measure the voltage of the +24V line between the fuse F3 and GND. Use a digital voltmeter capable of measuring 100mV steps.
3. Set the MODE switch to the SRV position and start the diagnostic program Job #150 with the next command procedure.

   150 → TL
4. Adjust pulse width of TPW at the test point TP1 as shown in the graph in Fig.3. The pulse width of TPW can be adjusted using the 200K pot VR2.

5. To terminate the diagnostic program, just press any key.

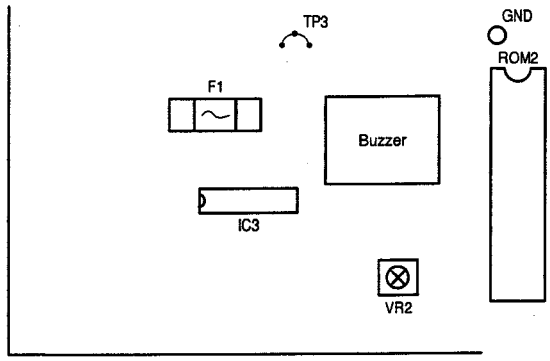


Fig. 3-4

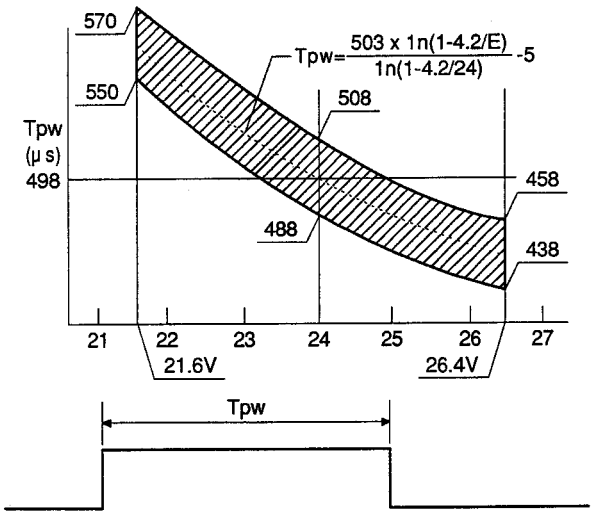


Fig. 3-5

[15] Option RAM test

① Key operation
200→ TL

② Content
The following check are performed for the optional RAM 128 KByte/32Kbyte SRAM. Do not change the memory contents before and after this check JOB.
The following process is performed for memory address to be checked (1E0000H - 1FFFFFH).
PASS1: memory data save
PASS2: Data "0000H" write
PASS3: Data "0000H" read and comparison, data "5555H" write
PASS4: Data "5555H" read and comparison, data "AAAAH" write
PASS5: Data "AAAAH" read and comparison
PASS6: Memory data restore
If a compare error is found in the check sequence from PASS1 to PASS6, error print (error code E01) is performed. If there is no error found to the end of the last address, the operation is completed normally.
Then the following address check is performed by judging the option chip to be integrated. The check point addresses are as follows:

Check point address (1) =	1E0000H
(For the ER-02RA)	1E0001H, 1E0002H
	1E0004H, 1E0008H
	1E0010H, 1E0020H
	1E0040H, 1E0080H
	1E0100H, 1E0200H
	1E0400H, 1E0800H
	1E1000H, 1E2000H
	1E4000H, 1E8000H
	1F0000H

Check point address (1) =	1E0000H
(For the ER-01RA)	1E0001H, 1E0002H
	1E0004H, 1E0008H
	1E0010H, 1E0020H
	1E0040H, 1E0080H
	1E0100H, 1E0200H
	1E0400H, 1E0800H
	1E1000H, 1E2000H
	1E4000H,

How to distinguish the ER-01RA and the ER-02RA

Write different data to two word addresses (1E0000 - 1H, 1E8000 - 1H), then read out the data and check that the data are proper. If proper, it is the ER-02RA.

(Procedure)
1. Write "FFA5" into 1E0000H in word width.
2. Write "FF5A" into 1E8000H in word width.
3. When 1E0000H is read in word width, if read data is "FFA5", the ER-02RA is installed. If read data is "FF5A", the ER-01RA is installed and on other unit is installed.

③ Print format

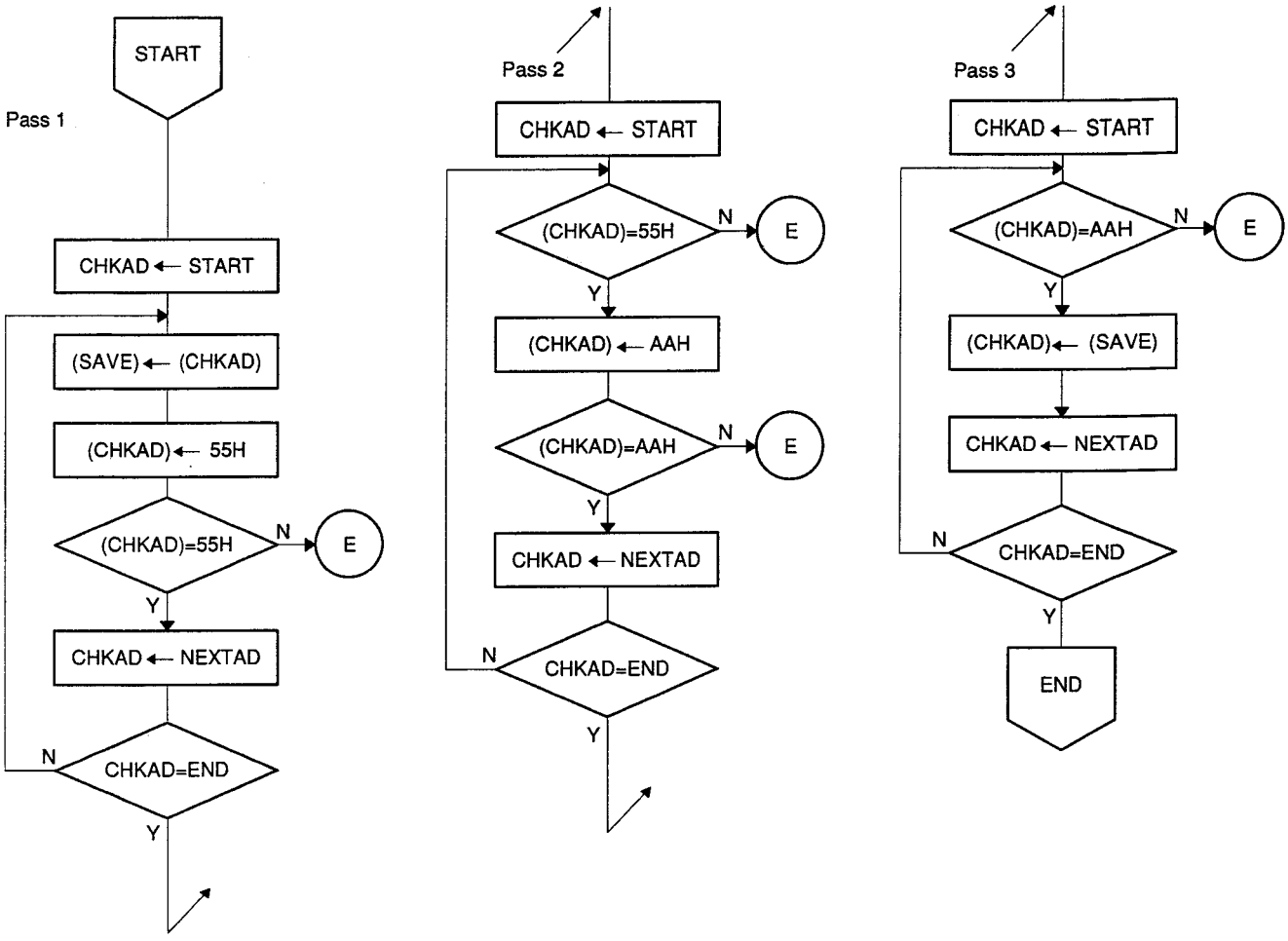
E01--- 01RA	200	(ER-01RA data check error)
E02--- 01RA	200	ER-01RA address check error)
E01--- 02RA	200	(ER-02RA data check error)
E02--- 02RA	200	(ER-02RA address check error)
01RA	200	(ER-01RA normal end)
02RA	200	(ER-02RA normal end)

(Supplement)
Read/write check (address check) on check points

Simultaneously with check pass 1 check address data save, 55H write & write check
(Write check: write operation check, comparison between write data and data in the written check address.)

Simultaneously with check pass 2 pass 1 55H read check, all write & write check
(Read check: comparison between check address data and check data.)

Simultaneously with check pass 3 pass 2 AAH read check, restor of saved data in (1).
In case of any error, error print 2 is performed. (Error code: E02)



[16] Option ROM test

① Key operation:
400 → TL

② Functional description:
A sum check is done for the option ROM (Address hex C80000H thru C9FFFFH.

③ Check the following items:
Check the termination printout.

④ Test termination:
The test terminates after printing the termination printout.
Termination printout

Normal termination		400
	ROM2	27010XXXXX
Abnormal termination	E -----	400
	ROM2	27010XXXXX

XXXXX: ROM version number

CHAPTER 6. DOWN LOAD FUNCTION

1. General

RAM data can be transmitted in the following two methods.
Save the data before servicing as follows:

① ECR ⟷ ECR

- Cable: ER-A5CB

Fig. 1-1

② ECR ⟷ ER-02FD

- Cable: Cable (QCNW-7578RCZZ) packed with the ER-02FD

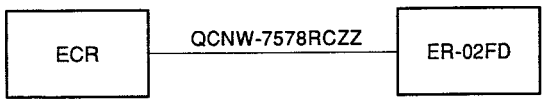


Fig. 1-2

2. SIO interface specification

1) Operation: Simplex
2) Line configuration: Direct connect
3) Data rate: 19200, 9600, 4800, 2400, 1200, 600, 300BPS (Selected by SRV JOB#903-A)
4) Sync mode: Asynchronous
5) Checking: Vertical parity (odd)
6) Code: 7 bits (ASCII)
7) Bit sequence: LSB first
8) Line level: TTL level
9) Data forma:

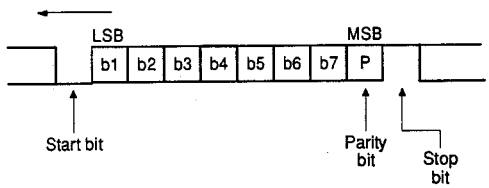


Fig. 2-1

3. Location of connector pins

① ER-A5CB

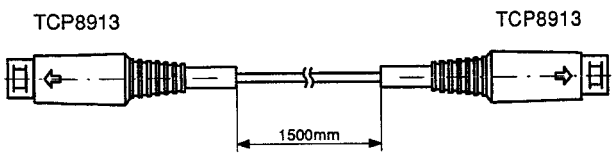


Fig. 3-1

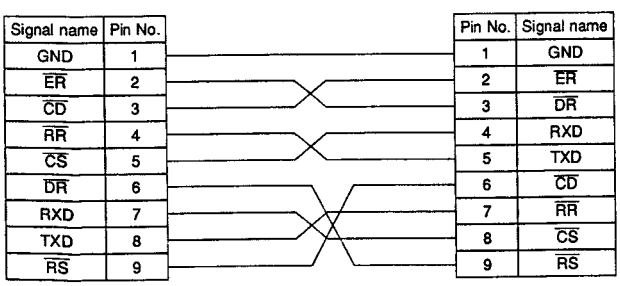


Fig. 3-2

② QCNW-7578RCZZ

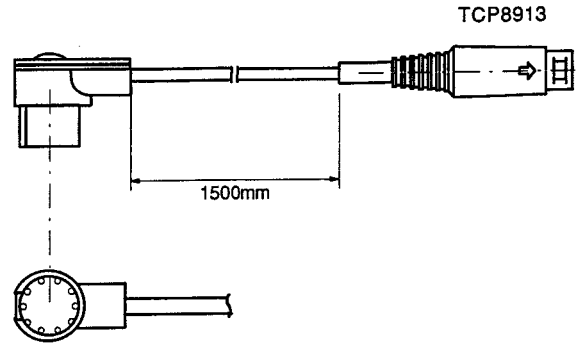


Fig. 3-3

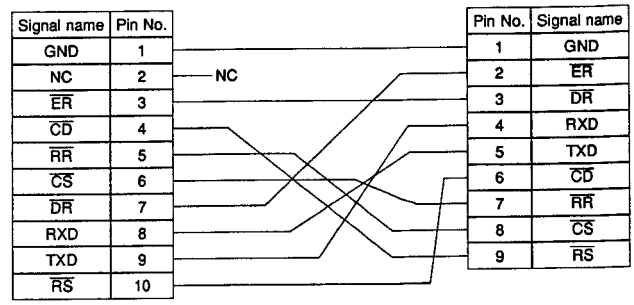


Fig. 3-4

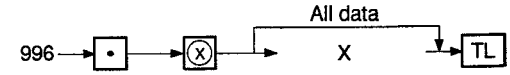
Interfacing signals

Pin No.	Signal name	In/Out	On level	Description
1	GND	—	—	Signal ground
2	$\overline{ER}$	Out	Low	Equipment ready
3	$\overline{DR}$	In	Low	Data set ready
4	RXD	In	High: MARK Low: SPACE	Receive data
5	TXD	Out	High: MARK Low: SPACE	Transmit data
6	$\overline{CD}$	In	Low	Carrier detect
7	$\overline{RR}$	Out	Low	Ready to receive
8	$\overline{CS}$	In	Low	Clear to send
9	$\overline{RS}$	Out	Low	Request to send

4. Application specification

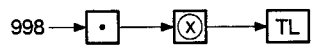
The following service (SRV) modes are available for the serial data transfer of the ER-A550.

1) Data transmit (Source side)



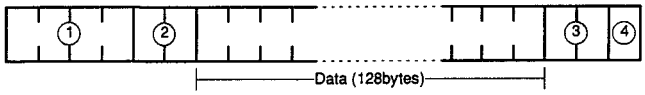
X = 0: SSP DATA

2) Data receive (Target)



5. Data format

A single byte image of the RAM data to be transmitted is divided into a high order 4 bits and low order 4 bits and converted into ASCII code. Then, the image of the memory is sent in the following format:



① Memory top address: 0000H ~ FFFFH
Top address of the memory to be transmitted in ASCII number.

② Page:1D ~ 1F
Page of the memory to be transmitted in ASCII number.

③ Sum check

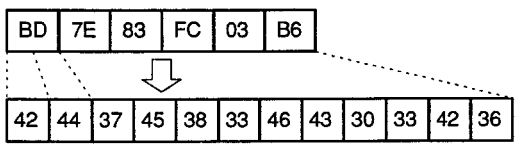
④ End code:
Hex 0D

NOTE:

- In order that contents of RAM memory may not over-ride pages for this job, RAM image is sent in unit of 64 bytes from the address 0000. In other words, 128 bytes are sent at one time on the transmit data format.

RAM DATA FORMAT

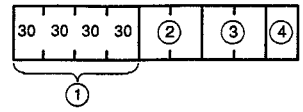
Exhibit:



Code table

HEX	ASCII	Character
0	30	0
1	31	1
2	32	2
3	33	3
4	34	4
5	35	5
6	36	6
7	37	7
8	38	8
9	39	9
A	41	A
B	42	B
C	43	C
D	44	D
E	45	E
F	46	F

6. END record



① End message:
Fixed to 30303030.

② End massage:
Fixed to 4646.

③ Sum check

④ End code:
CR (0D)

7. Operational method

1) To prepare an ER-A550 to receive data from another ER-A550 or the ER-02FD, the memory size of the receiving unit must the same as or greater than the sending unit.

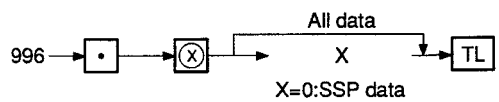
2) Master reset the receiving ER-A550.

3) Match the baud rate of the transmitter with the receiver using JOB#995 in the SRV mode.

4) Connect loader cable (QCNW-7578RCZZ or ER-A5CB) between ER-A550s.

5) Set the receiving ER-A550 ready to receive.

6) Start the sending ER-A550.



7) Transmission status.
Description of error status
1: Application error (Command error)
2: Line error (DTR OFF)
3: Application error (Parity error)
4: Application error (Check sum error)
5: Application error (Data size error)
6: Hard ware error
7: Power off error
10: Time out error
11: Application error (Transmit data size error)
12: Application error (Block sequence error)
13: Memory full error

8) Service reset the receiving ER-A550.

8. Saving/Loading of data to/From the FD unit Configuration

1) Turn off the power switch of the ER-02FD, and set the DIP switches of the FD unit as follows:

ER-02FD (The ER-01FD functions of the ER-02FD are used.)

DS-1								DS-2			
1	2	3	4	5	6	7	8	1	2	3	4
OFF	ON	OFF	ON	ON	OFF	OFF	OFF	X	OFF	OFF	OFF

Data rate

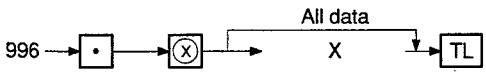
4	6	Rate [bps]
OFF	OFF	19200
ON	OFF	9600
OFF	ON	4800
ON	ON	2400

Disk format
CCP/M: OFF
PC-DOS: ON

2) Connect the QCNW-7578RCZZ cable.

Saving data

1) Turn on the power switch and insert a floppy disk which has been formatted.
2) Start the SEND JOB on the ECR side as follows:

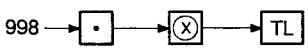


X = 0: SSP DATA

3) Data transmission is started and the green lamp on the ER-02FD blinks.

Loading data

1) Turn on the power switch and insert the floppy disk which stores the data.
2) Start the RECEIVE JOB on the ECR side as follows:



3) Press the [SEND] key on the FD unit.
4) Data transmission is started and the Green lamp on the ER-02FD blinks.
5) Service reset the ECR.

CHAPTER 7. SERVICE PRECAUTION

1. Hints and tips when installing the RAM chip option (ER-02RA)

1) When the RAM option (ER-02RA) is to be installed to the main PWB, be sure that the ER-02RA is facing in the right direction.

2. Printer motor lock

In the ER-A550, the motor will automatically turn off when a premature halting of the timing signals occurs due to a paper misfeed, ribbon jam, intrusion of alien object, etc. When the motor stops, an intermittent beeping will occur, with no indication in the display.

<How to reset the motor lock>: R/J printer

1) Disconnect the AC cord from the wall outlet. And remove the cause.
2) When power is restored, the following is displayed.

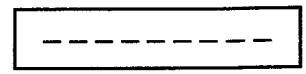


Fig. 2-1

3) Depress the [CL] key to return the ER-A550 to the point where the cause happened. The power failure symbols will be printed after a line feed.
4) Print sample

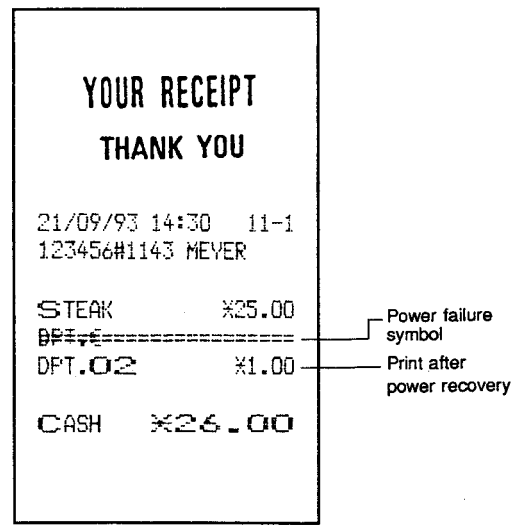


Fig. 2-2

3. Note for upper cabinet installation

When installing the upper cabinet again, be sure to connect the GND wire (QCNW-7120RCZZ) to the proper connector in front of the printer.

4. R/J printer dot pulse width adjustment

The dot pulse width adjust circuit is provided to control the width of the current applied to the dot head of the printer KI-OB6754RCZZ, according to a supply voltage fluctuation.
When the circuit is changed with a new one for such as a repair work, the dot pulse width needs to be adjusted using the 200K pot VR2.

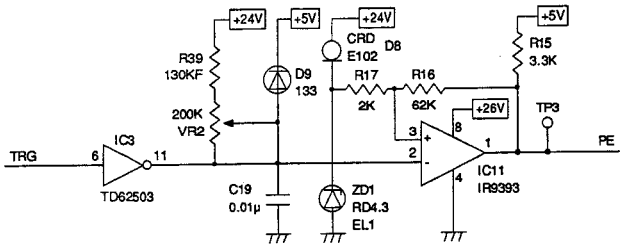


Fig. 4-1

<Adjusting method>

① Turn power on.

② Measure the voltage of the +24V line between the fuse F1 and GND. Use a digital voltmeter capable of measuring 100mV steps.

③ Set the MODE switch to the SRV position and start the diagnostic program Job #150 with the next command procedure.

150 → TL

④ Adjust pulse width of Tpw at the test point TP3 like shown in the graph. The pulse width of Tpw can be adjusted using the 200K pot VR2.

⑤ To terminate the diagnostic program, just press any key.

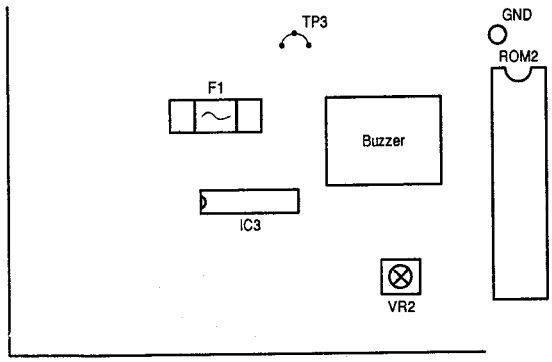


Fig. 4-2

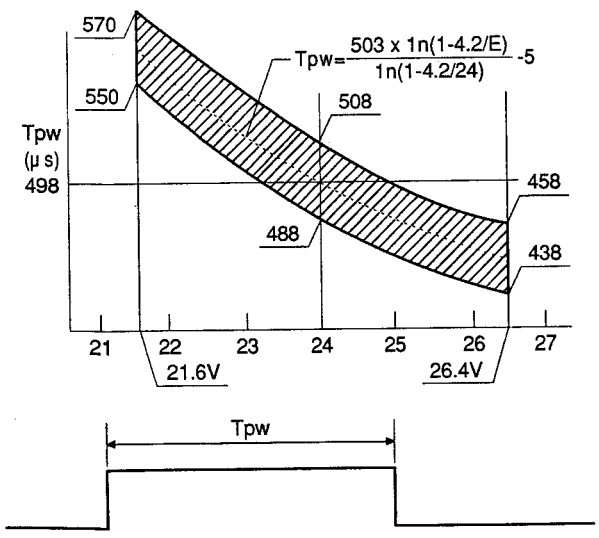


Fig. 4-3

5. Others

1) If D1 shorts, the VRAM is shorted with the 5V supply.
In this event, normal operation is usually possible, except that it may not recharge the battery, failing to back it up, resulting in memory frustration.

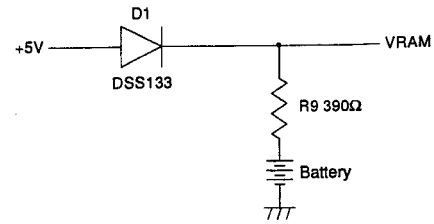


Fig. 5-1

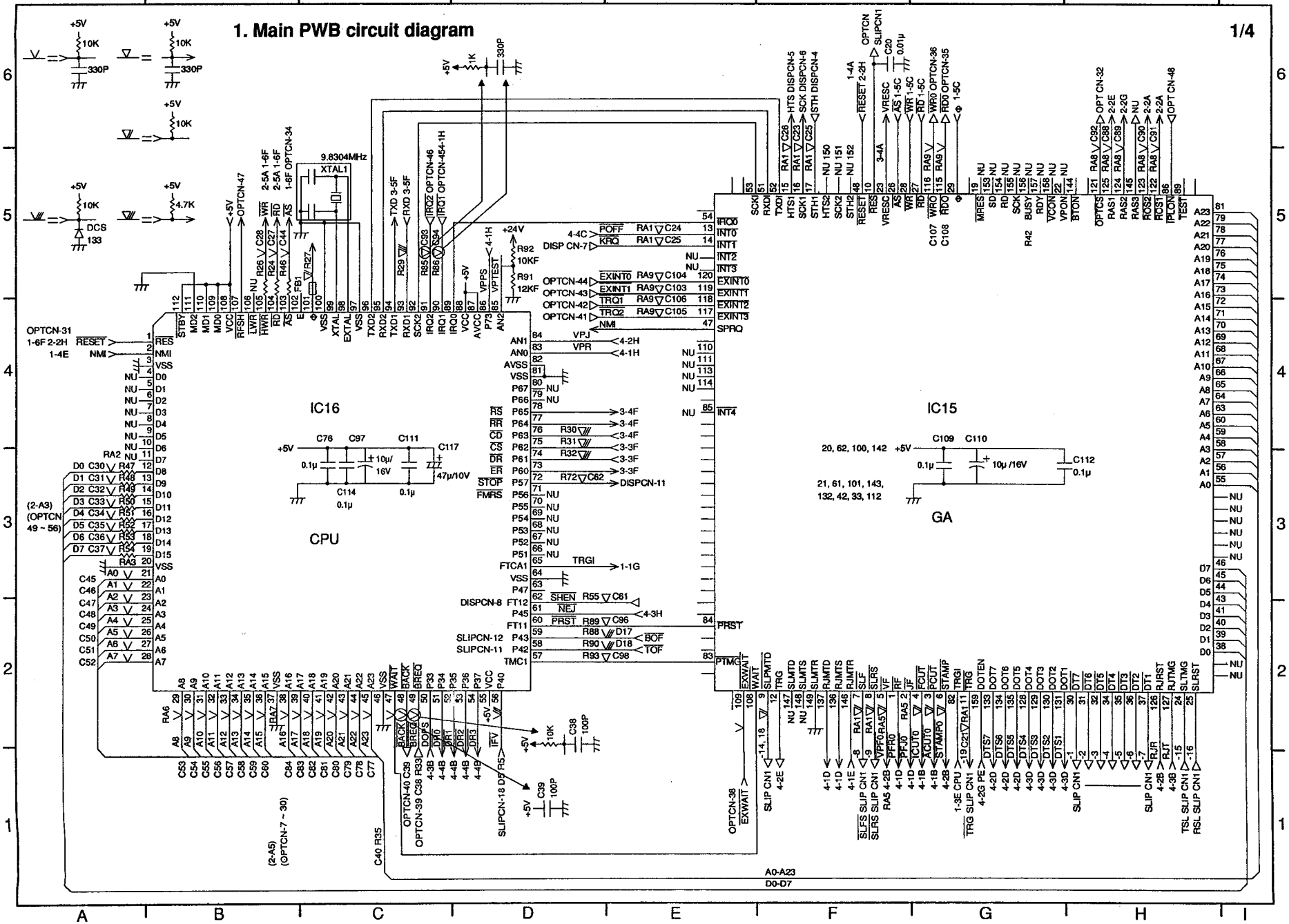
2) When installing the option I/F PWB, be sure to connect it to the left side (under the power PWB) when viewed from the rear of the body. Do not use the right side (under the printer).

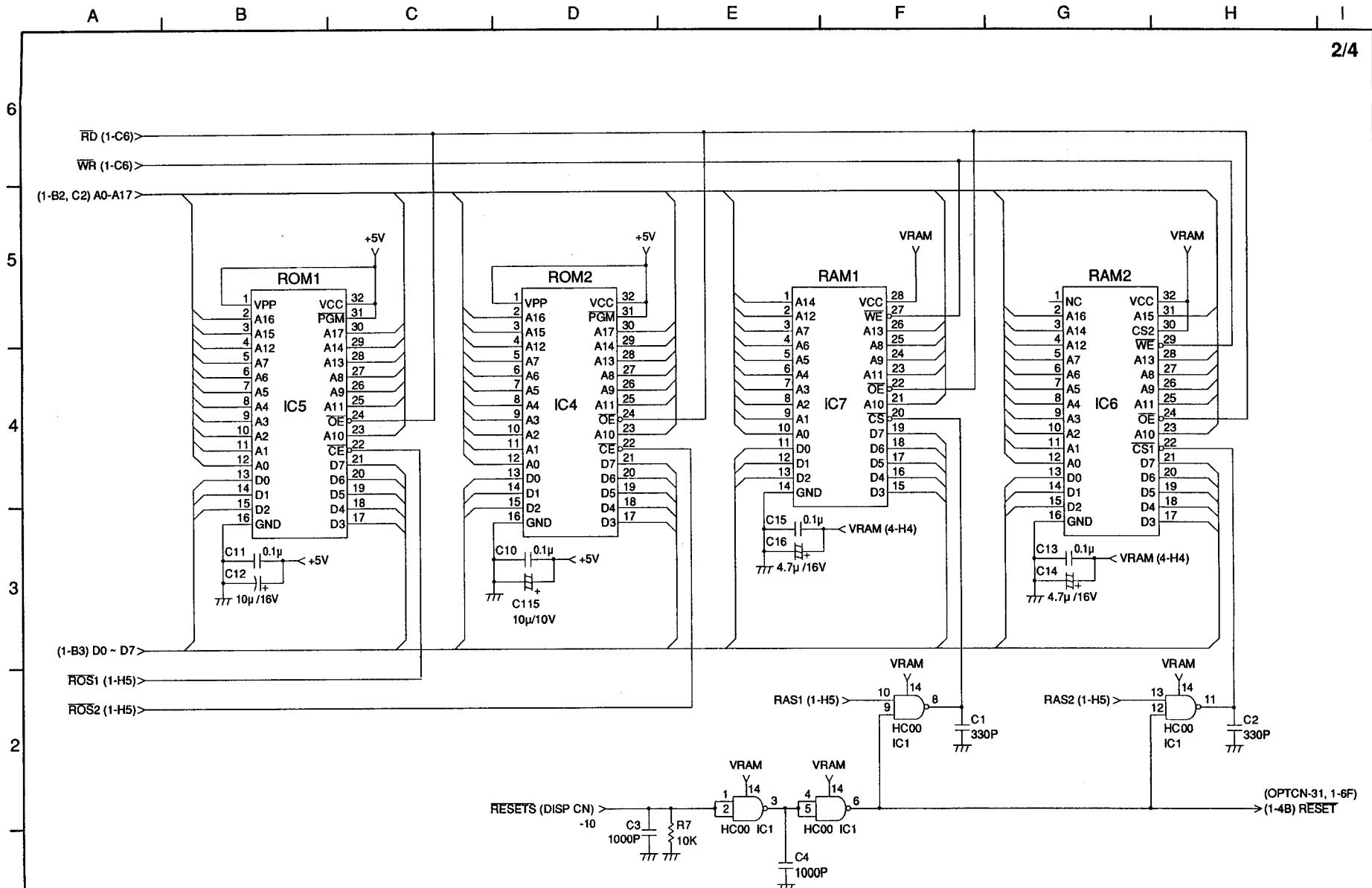
3) When fuse F2 above the main PWB is blown off, be sure to check the zenor diode ZD5 (VHERD5.6FB3-1) for any damage as well as replace F2. If the diode is damaged, replace it with new one.

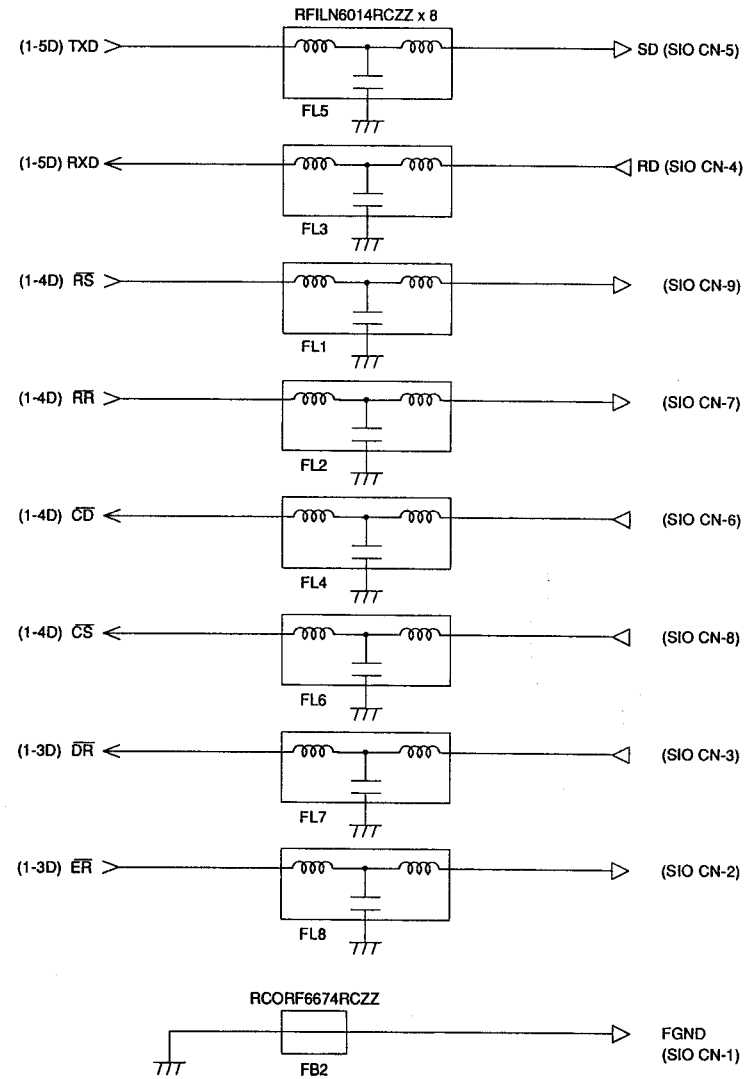
4) When removing or installing the option slot rear cover, be sure to lift up the pop-up display. Especially when installing the cover, be sure not to pinch the pop-up display cable between the upper cabinet and the cover.

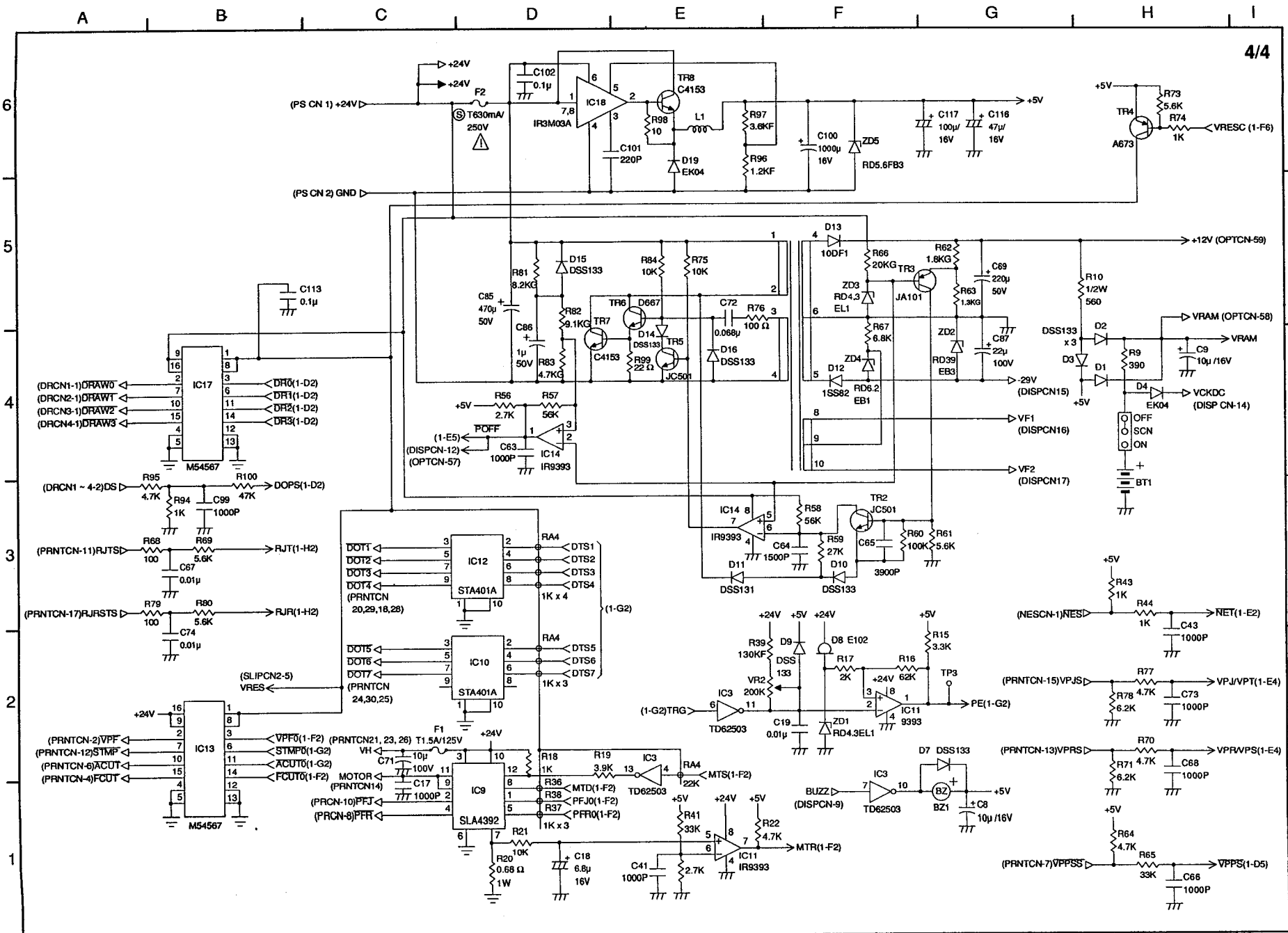
1. Main PWB circuit diagram

1/4




RD (1-C6)
WR (1-C6)
(1-B2, C2) A0-A17
(1-B3) D0 ~ D7
ROS1 (1-H5)
ROS2 (1-H5)
ROM1
IC5
+5V
C11 0.1µ
C12 10µ/16V
ROM2
IC4
C10 0.1µ
C115 10µ/10V
RAM1
IC7
VRAM
C15 0.1µ
C16 4.7µ/16V
VRAM (4-H4)
RAM2
IC6
C13 0.1µ
C14 4.7µ/16V
RAS1 (1-H5)
RAS2 (1-H5)
HC00 IC1
C1 330P
C2 330P
RESETS (DISP CN)
-10
C3 1000P
R7 10K
C4 1000P
(OPTCN-31, 1-6F)
(1-4B) RESET


RFILN6014RCZZ x 8
(1-5D) TXD
SD (SIO CN-5)
FL5
(1-5D) RXD
RD (SIO CN-4)
FL3
(1-4D) RS
(SIO CN-9)
FL1
(1-4D) RR
(SIO CN-7)
FL2
(1-4D) CD
(SIO CN-6)
FL4
(1-4D) CS
(SIO CN-8)
FL6
(1-3D) DR
(SIO CN-3)
FL7
(1-3D) ER
(SIO CN-2)
FL8
RCORF6674RCZZ
FGND
(SIO CN-1)
FB2


4/4
(PS CN 1) +24V
(PS CN 2) GND
F2
T630mA/ 250V
IC18
IR3M03A
TR8 C4153
L1
D19 EK04
ZD5 RD5.6FB3
+5V
TR4 A673
VRESC (1-F6)
+12V (OPTCN-59)
D13 10DF1
TR3 JA101
ZD3 RD4.3 EL1
ZD2 RD39 EB3
ZD4 1SS82 RD6.2 EB1
-29V (DISPCN15)
VF1 (DISPCN16)
VF2 (DISPCN17)
VRAM (OPTCN-58)
VRAM
VCKDC (DISP CN-14)
OFF SCN ON
BT1
IC17 M54567
(DRCN1-1)DRAW0
(DRCN2-1)DRAW1
(DRCN3-1)DRAW2
(DRCN4-1)DRAW3
DR0(1-D2)
DR1(1-D2)
DR2(1-D2)
DR3(1-D2)
(DRCN1 ~ 4-2)DS
DOPS(1-D2)
(PRNTCN-11)RJTS
RJT(1-H2)
(PRNTCN-17)RJRSTS
RJR(1-H2)
IC12 STA401A
IC10 STA401A
DOT1
DOT2
DOT3
DOT4
(PRNTCN 20,29,18,28)
DOT5
DOT6
DOT7
(PRNTCN 24,30,25)
DTS1
DTS2
DTS3
DTS4
1K x 4
DTS5
DTS6
DTS7
1K x 3
(1-G2)
(SLIPCN2-5)
VRES
IC13 M54567
(PRNTCN-2)VPF
(PRNTCN-12)STMP
(PRNTCN-6)ACUT
(PRNTCN-4)FCUT
VPF0(1-F2)
STMP0(1-G2)
ACUT0(1-G2)
FCUT0(1-F2)
(PRNTCN21, 23, 26) T1.5A/125V
VH
MOTOR (PRNTCN14)
(PRCN-10)PFJ
(PRCN-8)PFR
IC9 SLA4392
MTD(1-F2)
PFJ0(1-F2)
PFR0(1-F2)
MTS(1-F2)
MTR(1-F2)
IC3 TD62503
IC11 IR9393
(1-G2)TRG
PE(1-G2)
TP3
BUZZ (DISPCN-9)
D7 DSS133
BZ1
(NESCN-1)NES
NET(1-E2)
(PRNTCN-15)VPJS
VPJ/VPT(1-E4)
(PRNTCN-13)VPRS
VPR/VPS(1-E4)
(PRNTCN-7)VPPSS
VPPS(1-D5)
IC14 IR9393
TR2 JC501
(1-E5)
(DISPCN-12)
(OPTCN-57)
POFF

2. Main PWB conector table

OPT CN

SIGNAL	PIN	PIN	SIGNAL
GND	1	35	GND
GND	2	36	GND
$\overline{RDO}$	3	37	(Φ)
$\overline{WRO}$	4	38	$\overline{EXWAIT}$
+5V	5	39	$\overline{BREQ}$
+5V	6	40	$\overline{BACK}$
A23	7	41	$\overline{TRQ2}$
A22	8	42	$\overline{TRQ1}$
A21	9	43	$\overline{EXINT1}$
A20	10	44	$\overline{EXINT0}$
A19	11	45	$\overline{TRRQ}$
A18	12	46	$\overline{RSRQ}$
A17	13	47	$\overline{RFSH}$
A16	14	48	$\overline{IPLON}$
A15	15	49	D7
A14	16	50	D6
A13	17	51	D5
A12	18	52	D4
A11	19	53	D3
A10	20	54	D2
A9	21	55	D1
A8	22	56	D0
A7	23	57	$\overline{POFF}$
A6	24	58	VRAM
A5	25	59	+12V
A4	26	60	A3
+24V	27	61	+24V
+24V	28	62	+24V
A1	29	63	A2
A0	30	64	$\overline{RES}$
$\overline{RESET}$	31	65	$\overline{AS}$
$\overline{OPTCS}$	32	66	NU
GNDP	33	67	GND
GNDP	34	68	GND

PR CN

SIGNAL	PIN	PIN	SIGNAL
+24V	1	2	$\overline{VDF}$
NU	3	4	$\overline{FCUT}$
NU	5	6	$\overline{ACUT}$
$\overline{VPPSS}$	7	8	$\overline{PFR}$
GND	9	10	$\overline{PFJ}$
RJTS	11	12	$\overline{STMP}$
VPRS	13	14	MOTOR
VPJS	15	16	NU
RJRSTS	17	18	$\overline{DOT3}$
+5V	19	20	$\overline{DOT1}$
VH	21	22	NU
VH	23	24	$\overline{DOT5}$
$\overline{DOT7}$	25	26	VH
NU	27	28	$\overline{DOT4}$
$\overline{DOT2}$	29	30	$\overline{DOT6}$

DISP CN

PIN	SIGNAL
1	GND
2	GND
3	+5V
4	STH
5	HTS
6	$\overline{SCK}$
7	$\overline{KRQ}$
8	$\overline{SHEN}$
9	BUZZ
10	$\overline{RESETS}$
11	$\overline{STOP}$
12	$\overline{POFF}$
13	GND
14	VCKDC
15	-29V
16	VE1
17	VE2
18	GND

NES CN

PIN	SIGNAL
1	$\overline{NES}$
2	GND

DR CN1

PIN	SIGNAL
1	$\overline{DRAW0}$
2	DS
3	+24V

DR CN2

PIN	SIGNAL
1	$\overline{DRAW1}$
2	DS
3	+24V

DR CN3

PIN	SIGNAL
1	$\overline{DRAW2}$
2	DS
3	+24V

DR CN4

PIN	SIGNAL
1	$\overline{DRAW3}$
2	DS
3	+24V

SIO CN

PIN	SIGNAL
1	FGND
2	$\overline{ER}$
3	$\overline{DR}$
4	RXD
5	TXD
6	$\overline{CD}$
7	$\overline{RR}$
8	$\overline{CS}$
9	$\overline{RS}$

SLIP CN1

PIN	SIGNAL
1	$\overline{DT7}$
2	$\overline{DT6}$
3	$\overline{DT5}$
4	$\overline{DT4}$
5	$\overline{DT3}$
6	$\overline{DT2}$
7	$\overline{DT1}$
8	$\overline{SLFS}$
9	$\overline{SLRS}$
10	$\overline{IFV}$
11	$\overline{TOF}$
12	$\overline{BOF}$
13	$\overline{RES}$
14	$\overline{M240}$
15	TSL
16	RSL
17	NU
18	$\overline{MTDS}$
19	$\overline{TRG}$
20	NU

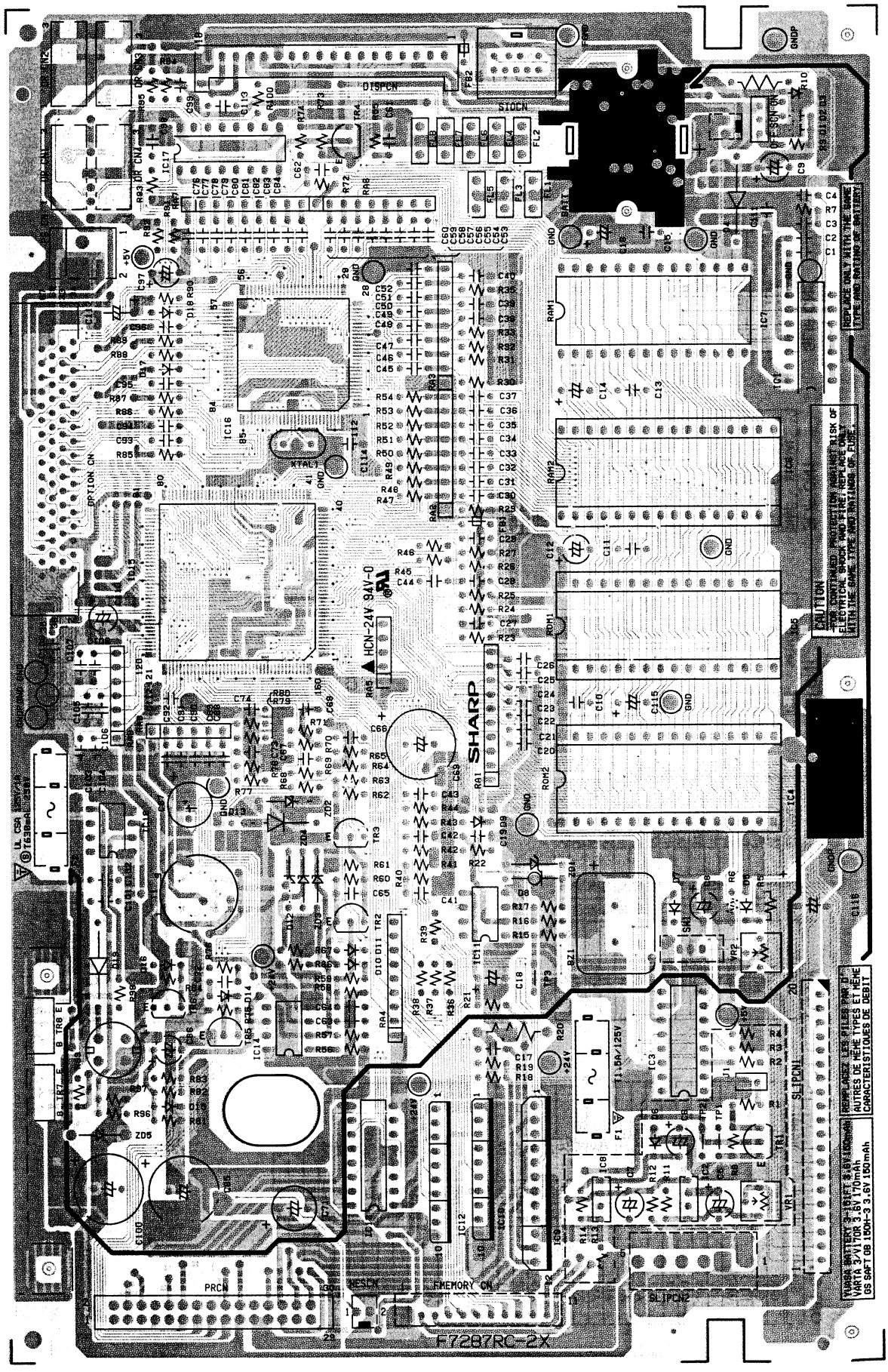
SLIP CN2

PIN	SIGNAL
1	+24V
2	GNDP
3	+5V
4	GND
5	VPOF

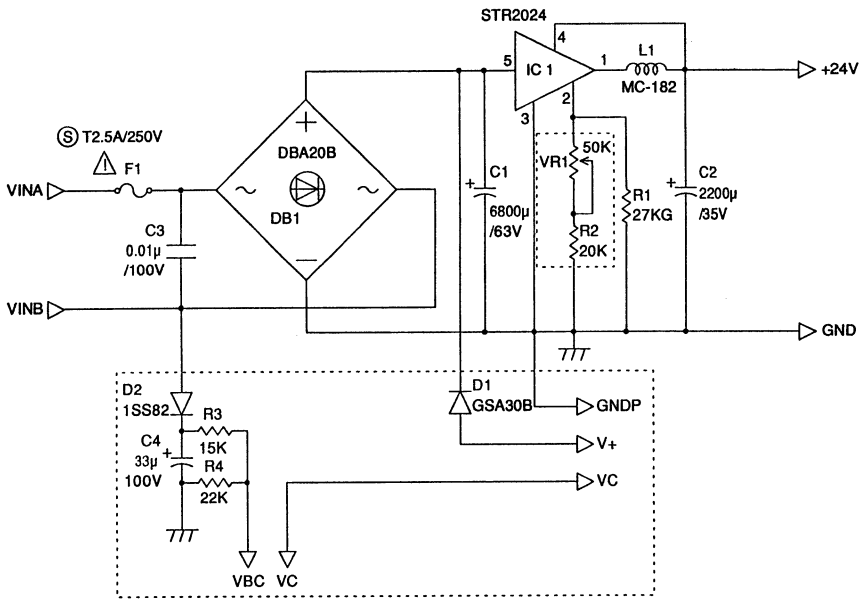
PS CN

PIN	SIGNAL
1	+24V
2	GND

3. Main PWB layout



4. PS PWB circuit diagram



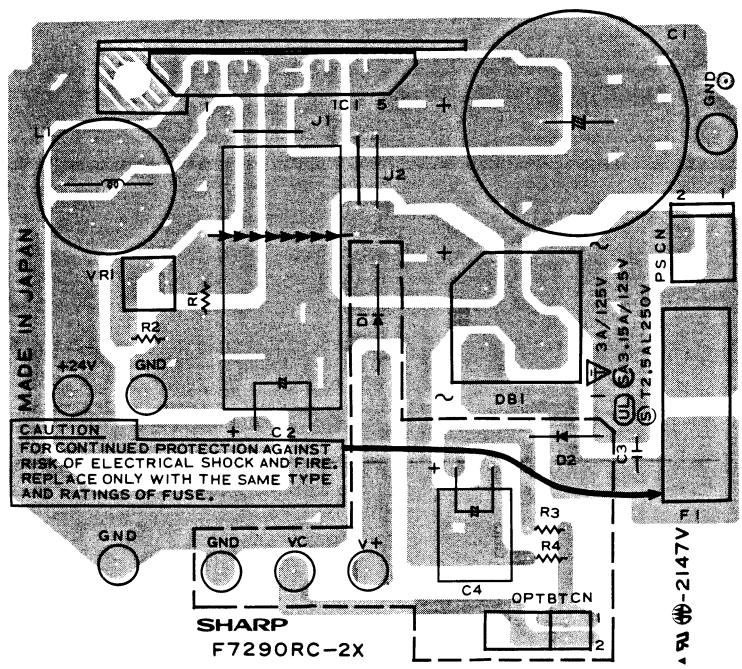
VIN CN

PIN	SIGNAL
1	VINA
2	VINB

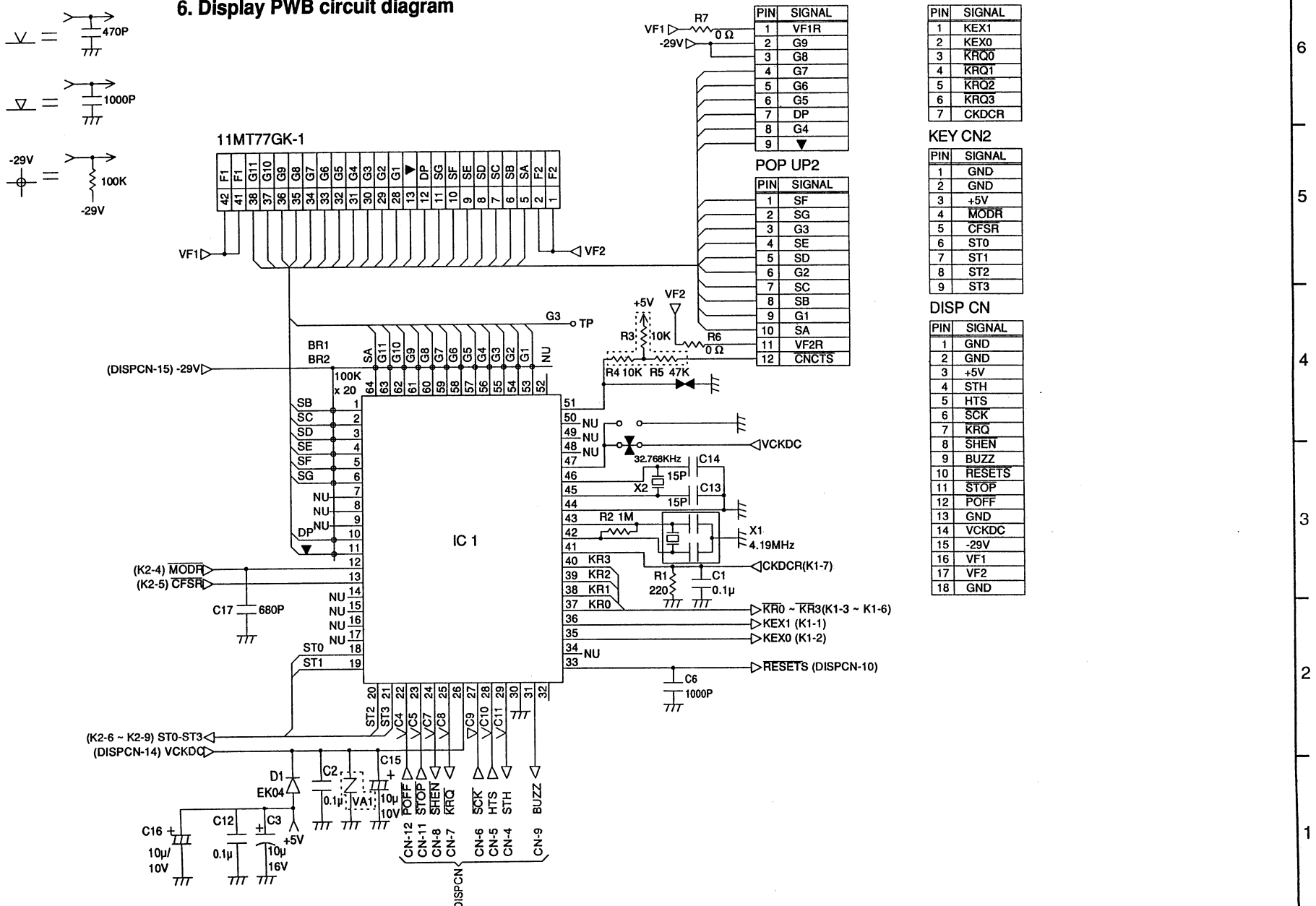
PIN	SIGNAL
1	V+
2	VC
3	GND

PIN	SIGNAL
1	VBC
2	VC

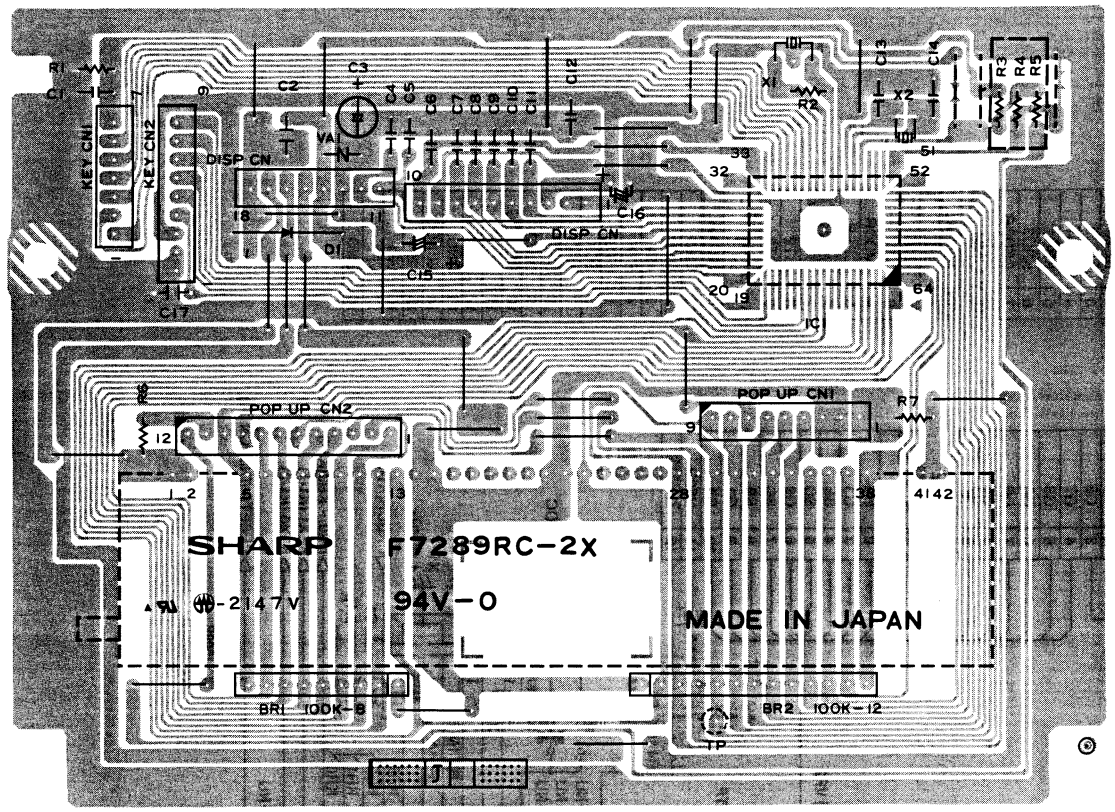
5. Power supply PWB layout



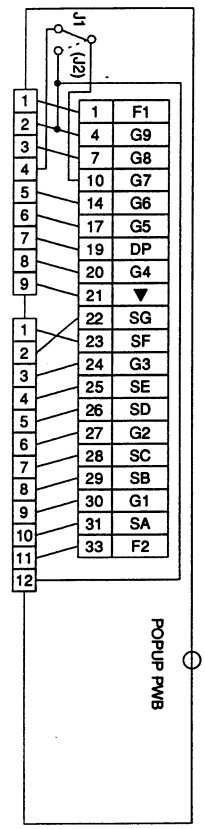
6. Display PWB circuit diagram



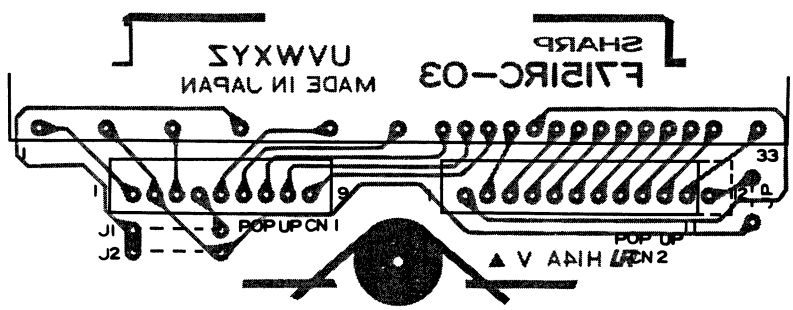
7. Display PWB layout



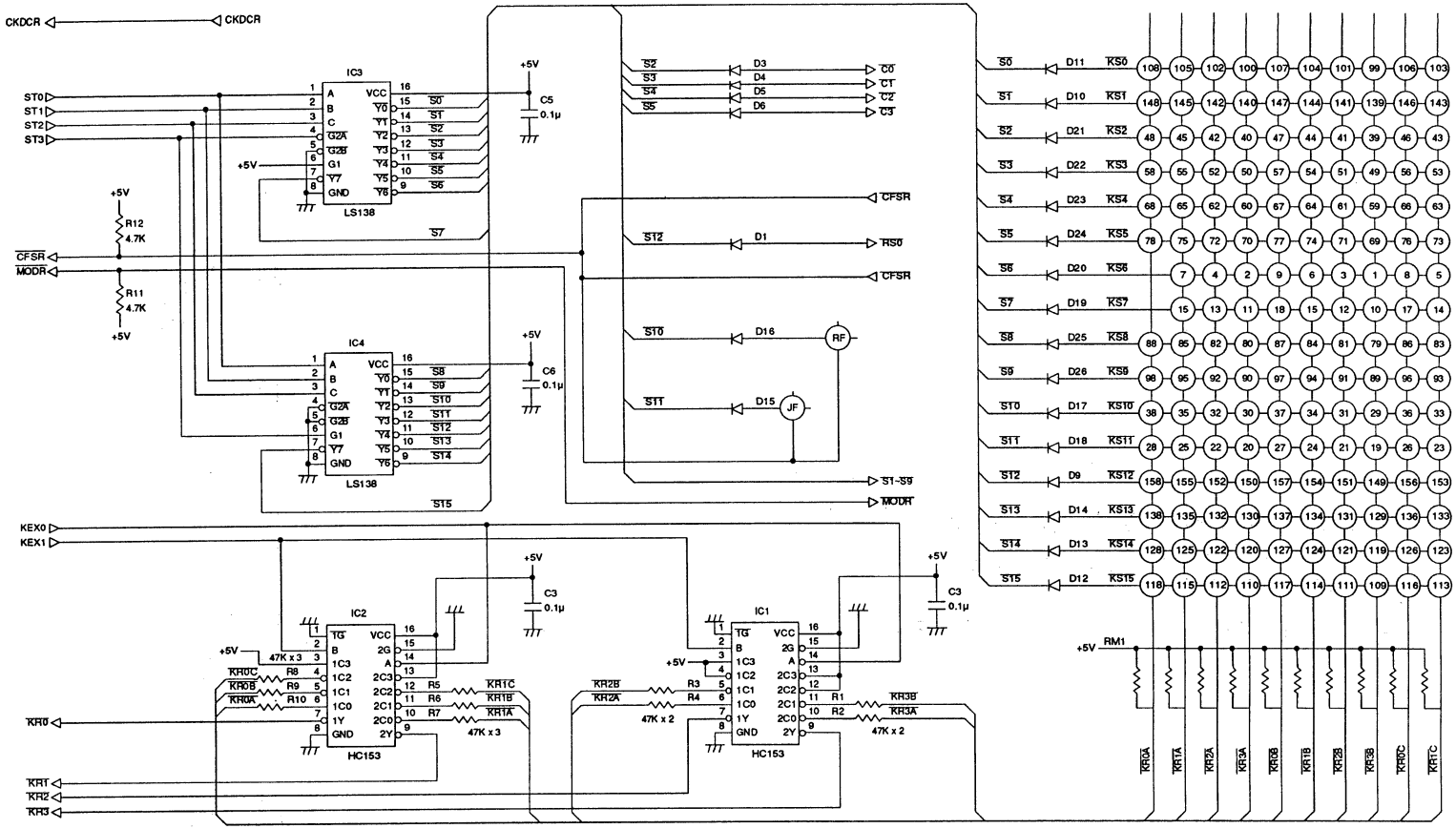
8. Pop-up display PWB circuit diagram



9. Pop-up display PWB layout



10. Keyboard PWB circuit diagram



CN1

KEY CN1	
1	KEX1
2	KEX0
3	KR0
4	KR1
5	KR2
6	KR3
7	CKDCR

CN2

KEY CN1	
1	GND
2	GND
3	+5V
4	MODR
5	CFSR
6	ST0
7	ST1
8	ST2
9	ST3

CN3

RECEIPT CN	
1	RS0
2	CFSR

CN4

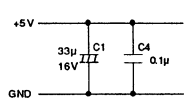
MODE SW CN	
1	MODR
2	+5V
3	CKDCR
4	S9
5	S8
6	S7
7	S6
8	S5
9	S4
10	S3
11	S2
12	S1

CN5

CASHIER CN1	
1	C0
2	C1
3	CFSR

CN6

CASHIER CN2	
1	C2
2	C3
3	CFSR



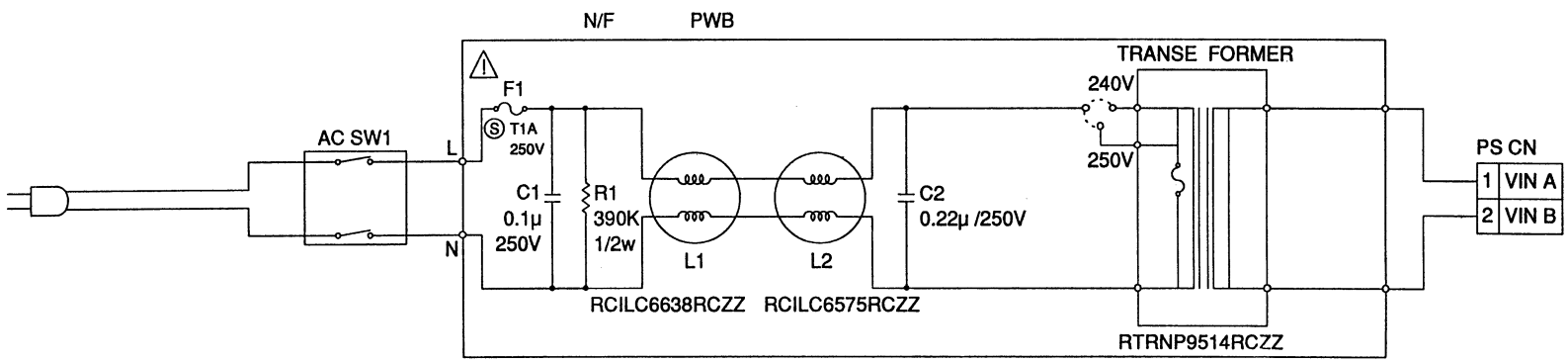
11. Keyboard position table

↑ RECEIPT	↑ JOURNAL	28	38	48	58	68	78	88	98	108	118	128	138	148	158
9	18	27	37	47	57	67	77	87	79	107	117	127	137	147	157
8	17	26	36	46	56	66	76	86	96	106	116	126	136	146	156
7	16	25	35	45	55	65	75	85	95	105	115	125	135	145	155
6	15	24	34	44	54	64	74	84	94	104	114	124	134	144	154
5	14	23	33	43	53	63	73	83	93	103	113	123	133	143	153
4	13	22	32	42	52	62	72	82	92	102	112	122	132	142	152
3	12	21	31	41	51	61	71	81	91	101	111	121	131	141	151
2	11	20	30	40	50	60	70	80	90	100	110	120	130	140	150
1	10	19	29	39	49	59	69	79	89	99	109	119	129	139	149

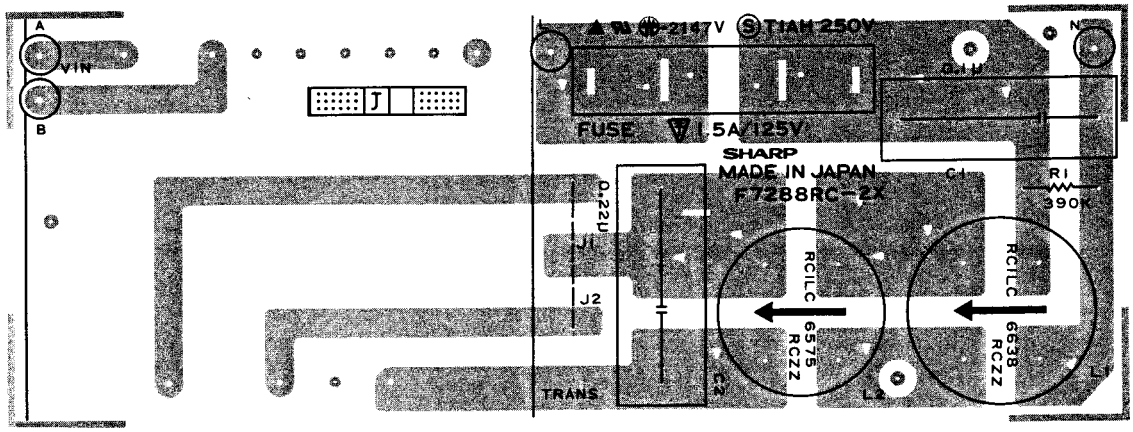
12. Noise filter PWB circuit diagram

NOISE FILTER PWB TYPE (F7288RC)

N/F TRANSE PWB UNIT



13. Noise filter PWB layout



SHARP PARTS GUIDE

MODEL ER-A550

PRINTER: M-820
(for KB, TQ, TR, TS)

CONTENTS

1 Top cabinet etc.
2 Bottom cabinet etc.
3 Drawer box unit (SS460 type)
4 Packing material & Accessories
5 Main PWB unit
6 Display PWB unit
7 Power supply PWB unit
8 Noise filter PWB unit
9 Customer display PWB unit
10 Articles for consumption
11 Special service tools and service options
12 AC cord
■ Index

Because parts marked with "⚠" is indispensable for the machine safety maintenance and operation, it must be replaced with the parts specific to the product specification.

Table of destinations

SELECTION CODE	COUNTRIES
U	U. S. A., Guam
A	Canada
TS	Germany
TQ	SEEG territory other than Germany (Stamp : English)
TR	SEEG territory other than Germany (Stamp : Spanish)
KB	U. Kingdom
KA	Australia

SELECTION CODE	COUNTRIES
SB	Saudi Arabia (127V area)
SBA	Saudi Arabia (220V area)
SC	Taiwan
SD	Venezuela
SE	Hong Kong
SG	Lebanon, Syria, Greece, Pakistan, Iran, Egypt, Thailand, Iraq, Mauritius, Seychelles, Tahiti, Jordan, Sudan, Turkey
SH	South Africa (U. S. A. version)
SHE	South Africa (Europe version)
SJ	Philippines (Europe version)
SJ2	Philippines (U. S. A. version)
SM	Kuwait, Qatar, Oman, UAE, Malta, Bahrain
SMT	Nigeria, Yemen, Kenya

SELECTION CODE	COUNTRIES
K	Korea

SELECTION CODE	COUNTRIES
RA1	Morocco, Algeria, Tunisia, West Africa
RA2	Chile, Uruguay, Peru, Argentina, Paraguay
RA5	Sri Lanka

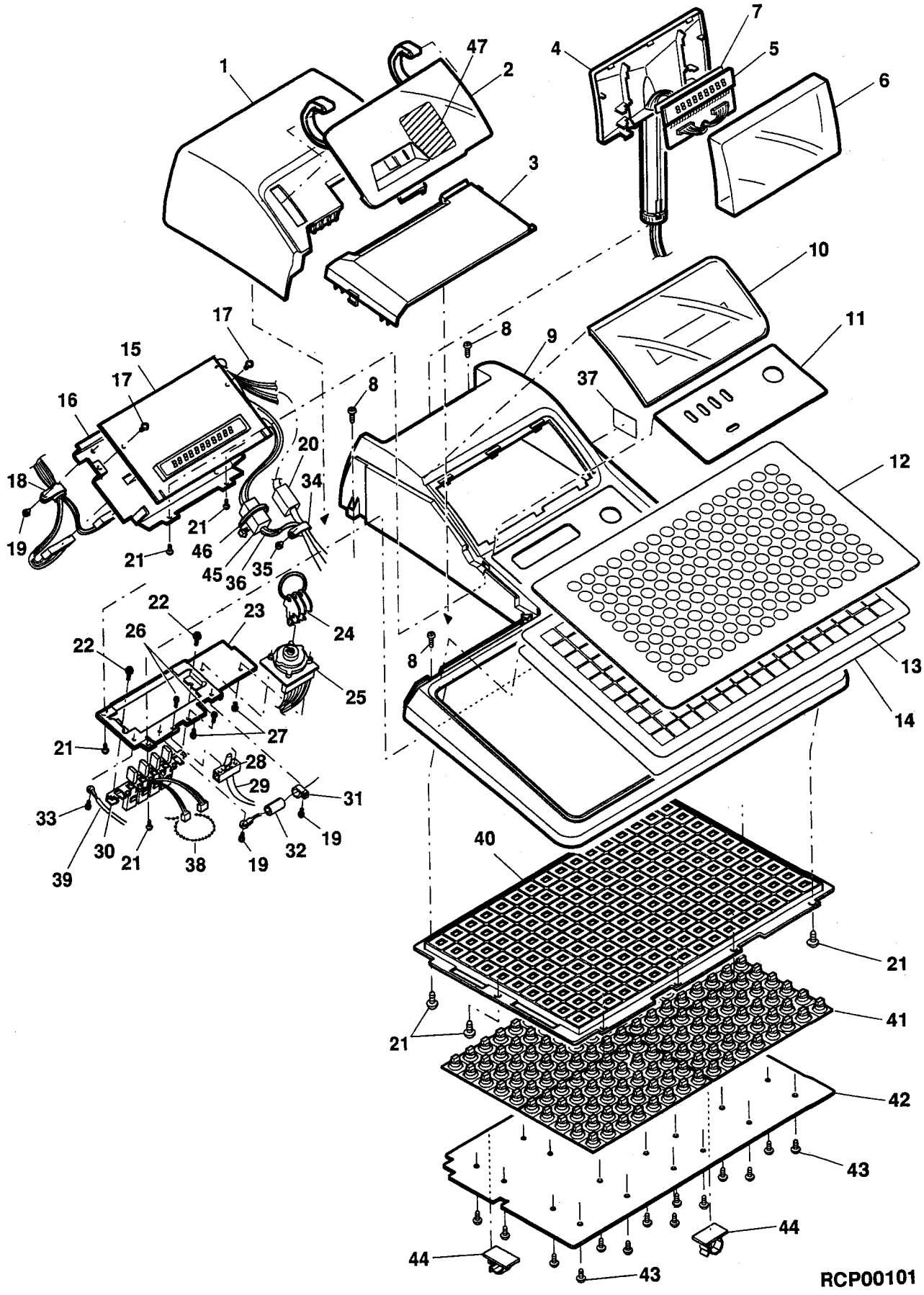
SELECTION CODE	COUNTRIES
RB3	Indonesia
RB4	
RB5	Cyprus
RB6	Panama
RB7	Barbados
RB8	Malaysia (U. S. A. version)

SELECTION CODE	COUNTRIES
RC1	Malaysia (Europe version)
RC2	Singapore
RC5	Dominican Republic, Ecuador

1 Top cabinet etc.

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	GCÖVA7038RCSA	AP		D	Printer cover
2	PFiLW6925RCZZ	AK		D	Journal filter
3	GCÖVA7039RCSA	AM		D	Ribbon cover
4	GCAB-7143RCZZ	AH		D	Pop-up cabinet
5	CPWBF7151RC01	BD		E	Customer display PWB unit
6	PFiLW6923RCSB	AN	N	D	Pop-up filter
7	PSPAG6703RCZZ	AB		C	Display spacer
8	XBBSC30P06000	AA		C	Screw (3×6)
9	GCABB7141RCSA	AY		D	Top cabinet
10	PFiLW6924RCSB	AM	N	D	Display filter
11	HPNLC6818RCSB	AH		D	Mode switch panel
12	GCÖVB7042RCZZ	AW		D	Flat key cover B
13	PSHEK6778RCZZ	AK	N	C	Flat key sheet(Standard)
14	GCÖVB7041RCZZ	AY		D	Flat key cover A
15	CPWBF7289RCS1	BM		E	Display PWB unit
16	LANGT7469RCZZ	AL		C	Display PWB angle
17	LX-BZ6665RCZZ	AA		C	Screw (3×6)
18	RCÖRF5003SCZZ	AK		C	Core(with clamp)
19	XHBSD30P08000	AA		C	Screw (3×8)
20	RCÖRF1016LCZZ	AL		C	Core (SFC-5)
21	XEBSD30P06000	AA		C	Screw (3×6)
22	XBPSD30P06K00	AA		C	Screw (3×6K)
23	LANGT7465RCZZ	AK		C	Switch angle
24	LKGiM7110RCZZ	AG		B	Mode switch key (MA)
	LKGiM7111RCZZ	AG		B	Mode switch key (OP)
	LKGiM7129RCZZ	AE		B	Mode switch key (SM)
25	LKGiW7256RCZZ	AP		B	Mode key switch (Body)
26	XBPSD26P04K00	AA		C	Screw (2.6×4K)
27	XUPSD23P08000	AA		C	Screw (2.3×8)
28	CSW-S6850RC01	AH		B	Slide switch unit
29	QCNW-7434RCZZ	AC		C	Harness (2pin)
30	CSW-P6875RC01	AW		B	Stay down switch unit
31	LHLDW0024SCZZ	AA		C	Wire holder (HP-2N)
32	RCÖRF6654RCZZ	AH		C	Core (5-28-8-F)
33	LX-BZ6774RCZZ	AA		C	Screw (4×6S)
34	LHLDW0004SCZZ	AB		C	Wire clamp (HP-6N)
35	XEBSD30P08000	AA		C	Screw (3×8)
36	QCNW-7456RCZZ	AQ		C	Display cable (18pin)
37	TCAUS6668RCZZ	AA		D	Caution label
38	LBNDJ0004UCZZ	AA		C	Band
39	QCNW-7120RCZZ	AE		C	Earth wire (Keyboard↔Printer angle)
40	0AL101KFG-001	AV		C	Housing (101KFG-001-90R)
41	0AL421KFG-001	BB		C	Rubber sheet (421KFG-001-90R)
42	0AL9090E1002R	BK		E	Keyboard PWB ass'y
43	0ALZD2006-670	AA		C	Screw (Z-D2006-670)
44	LHLDW5034BCZZ	AB		C	Wire holder (CKN-10)
45	RCÖRF6662RCZZ	AK		C	Core (SFC-6)
46	LBNDJ2004SCZZ	AA		C	Wire band (PLT-1.5I)
47	PFiLW6926RCZZ	AD		D	Clear filter
101	0ALW-P9002-01	AC		B	Connector (W-P9002#01)(2pin)
102	0ALW-P9003-01	AC		C	Connector (W-P9003#01)(3pin)
103	0ALW-P9003-50	AC		C	Connector (3pin)
104	0ALW-P5107-51	AC		C	Connector (7pin)
105	0ALW-P5109-51	AC		C	Connector (9pin)
106	0ALZZ0520013 8	AQ		B	IC (LS138)(Z-0520-00138)
107	0ALZY0360087 4	AH		B	IC (HC153)
108	RMPTC0473QCKB	AD		B	Block resistor
109	0ALZW8AA473DJ	AA		C	Resistor (47KΩ)(Z-08AA-473DJ#01)
110	0ALZV12CK104E	AD		C	Capacitor (0.1μF)(Z-V12CK104EMSR#1)
111	VHDDSS133//-1	AA		B	Diode (DSS133)
112	VRD-HT2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)
113	VCEAGU1CW336M	AA		C	Capacitor (16WV 33μF)
501	DUNTK9161RCZZ	BL		E	Keyboard unit(flat type) [Include №40~43,101~113]

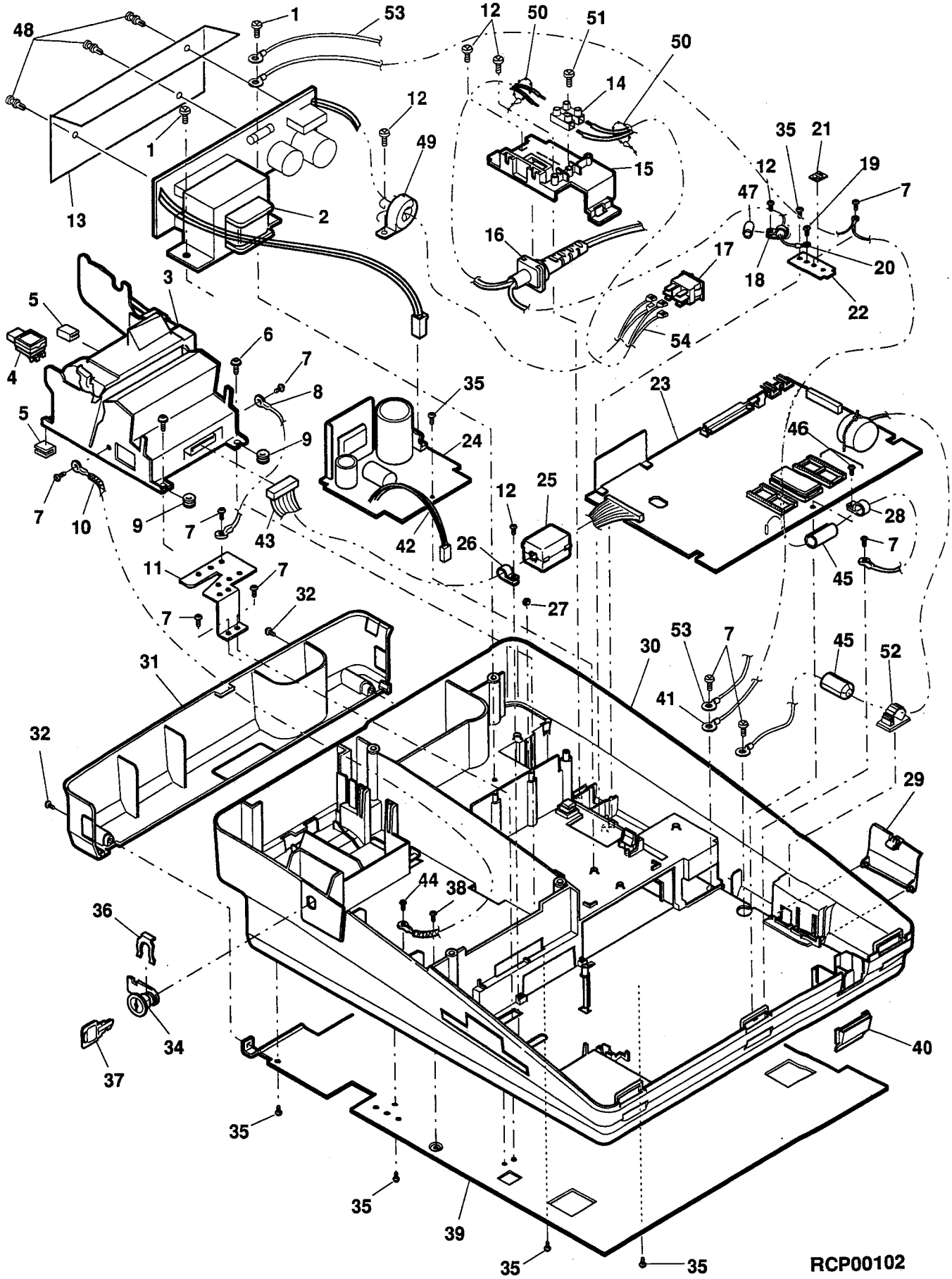
1 Top cabinet etc.



2 Bottom cabinet etc.

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	XUBSD40P08000	AA		C	Screw (4×8)	
⚠ 2	CPWBF7288RC01	BM	N	E	Noise filter PWB unit	[TQ,TR,TS]
⚠	CPWBF7288RC02	BM	N	E	Noise filter PWB unit	[KB]
3	Ki−ŌB6754RCZZ	CB		E	Printer unit (M−820)	
4	PSTM−6780RCZZ	AR		C	Stamp	[TQ]
	PSTM−6782RCZZ	AS		C	Stamp	[TR]
	PSTM−6785RC01	AS		C	Stamp	[TS]
5	PGUMM6699RCZZ	AB		C	Printer cushion	
6	XCPSD30P12X00	AA		C	Screw (3×12X)	
7	LX−BZ6774RCZZ	AA		C	Screw (4×6S)	
8	QCNW−7125RCZZ	AD		C	GND wire 3	
9	PCUSG1220CCZZ	AB		D	Printer cushion	
10	QCNW−7122RCZZ	AD		C	Earth wire	
11	LANGQ7476RCZZ	AF		C	Printer eath angle	
12	XEBSD30P08000	AA		C	Screw (3×8)	[KB]
13	PSHEP6789RCZZ	AG	N	C	N/F protection sheet	
14	QTANN6629RCZZ	AF		C	Block terminal (TYP500)	
15	LHLDK6813RCSA	AE		D	PS holder	
⚠	QCNW−7212RCZZ	AH		B	BS ordiary cable	[KB]
⚠ 16	QPLGA0006QCZZ	AQ		C	Plug (3A 250V)	[KB]
⚠	QACCE3120QCN5	AL		B	AC cord (250V 2.5A)	[TQ,TR,TS]
17	QSW−C9212QCZZ	AH		B	Seesaw switch	
18	LHLDW0007SCZZ	AA		C	Wire holder (HP−7N)	[KB]
19	XBPBZ40P06K00	AA		C	Screw (4×6K)	[KB]
20	QTANP0004HCZZ	AB		C	Lug terminal (4φ)	[KB]
21	TLAB−4681CCZZ	AA		C	Earth mark label (Export)	[KB]
22	LANGQ7472RCZZ	AE		C	Main earth angle	[KB]
23	CPWBF7287RC02	CG	N	E	Main PWB unit	
24	CPWBF7290RC02	BL	N	E	Power supply PWB unit	
25	RCŌRF6666RCZZ	AM		C	Core (SFC−8)	
26	LHLDW0008SCZZ	AA		C	Wire holder (HP−5N)	
27	XNESD30−24000	AA		C	Nut (3NS)	
28	LHLDW0024SCZZ	AA		C	Wire holder (HP−2N)	
29	GFTAS6769RCSA	AC		D	SIO connecter lid	
30	GCABA7142RCSB	BD	N	D	Bottom cabinet	
31	GCŌVA7040RCSA	AQ		D	Rear cover	
32	XBBSC30P20000	AA		C	Screw (3×20)	
34	LKGiW2363RCZZ	AL		B	Lock key (body)	
35	XEBSD30P06000	AA		C	Screw (3×6)	[KB]
36	MSPRK6660RCZZ	AC		C	Lock spring	
37	LKGiM6784RCZZ	AD		B	Printer cover key (1PC)	
38	XHPSD40P08KS0	AA		C	Screw (4×8KS)	
39	LCHSM6692RCZZ	AV		C	Main chassis	
40	GFTAF6770RCSA	AC		D	Clerk key lid	
41	QCNW−7592RCZZ	AD	N	C	Earth wire G/Y	[KB]
42	QCNW−7575RCZZ	AE		C	PS cable (2pin)	
43	QCNW−7518RCZZ	AR		C	Printer cable	
44	XBPSD30P06KS0	AA		C	Screw (3×6K)	
45	RCŌRF6661RCZZ	AK		C	Core (SFC−4)	
46	XUBSD30P10000	AC		C	Screw (3×10)	
47	RCŌRF6682RCZZ	AE	N	C	Core	[KB]
48	LBSHZ2021HCZZ	AA		C	Bushing (NRP−232)	
49	RCŌRF7001SCZZ	AL		C	Core (ESD−R−25DR)	
50	LBNDJ0004UCZZ	AA		C	Band	
51	XUPSD30P16000	AA		C	Screw (3×16)	
52	LHLDW2341RCZZ	AB		C	Cable clamp (CKN−05)	
53	QCNW−7590RCZZ	AC	N	C	Earth wire	[TQ,TR,TS]
54	QCNW−7591RCZZ	AE	N	C	Shield cable	

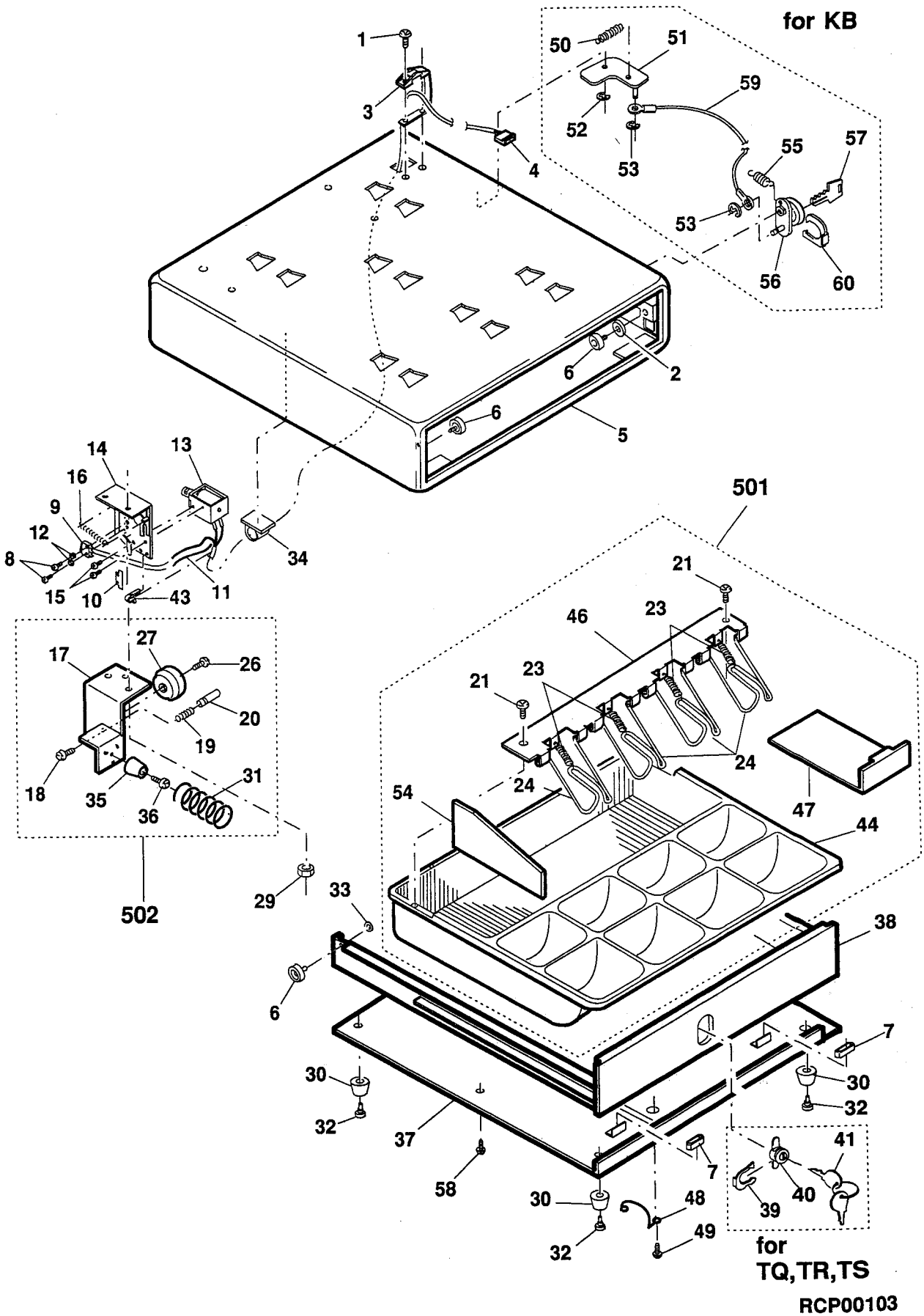
2 Bottom cabinet etc.



3 Drawer box unit(SS460type)

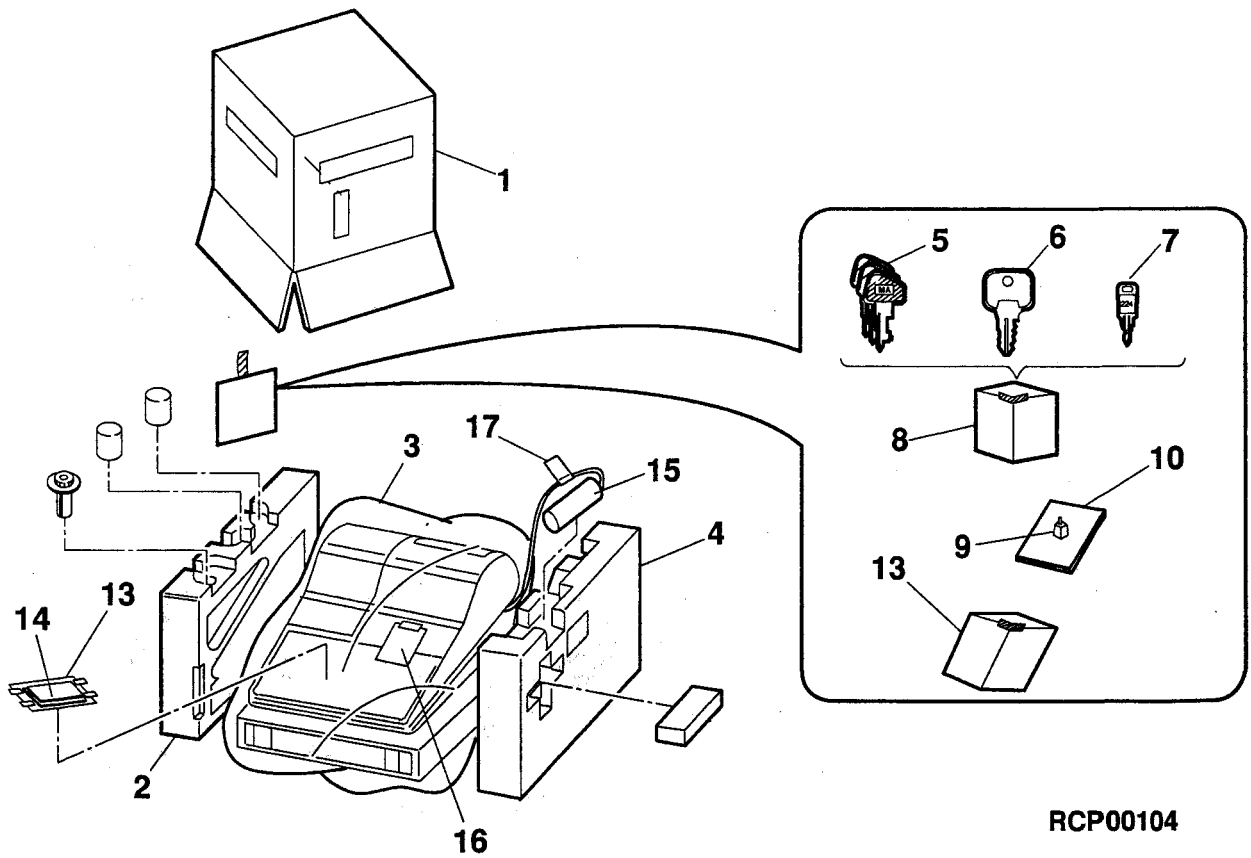
NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	XHBSD30P08000	AA		C	Screw (3×8)
2	LX-WZ0052FCZZ	AA		C	Washer
3	LHLDW0024SCZZ	AA		C	Wire holder (HP-2N)
4	QCNW-7579RCZZ	AH		C	Connector with wire
5	GCABM7152RCZZ	BL	N	D	Drawer cabinet [KB]
	GCABM7146RCZZ	BK		D	Drawer cabinet [TQ,TR,TS]
6	NRŌLP6643RCZZ	AE		C	Roller
7	PGUMM6659RCZZ	AB		C	Stopper rubber (Front)
8	XBPSD23P10000	AA		C	Screw (2.3×10)
9	QSW-M2128SCZZ	AG		B	Microswitch
10	PSHEZ6735RCZZ	AB		C	Insulation sheet
11	QCNW-6637RCZZ	AB		C	Lead wire for microswitch
12	XWHSD26-05075	AA		C	Washer (2.6)
13	PMAGE6631RC01	AQ		B	Plunger
14	DUNTM8517RCZZ	AN		C	Lock frame unit
15	XBPSD30P05K00	AA		C	Screw (3×5K)
16	MSPRT6695RCZZ	AB		C	Open spring
17	LFRM-6667RCZZ	AF		C	Bell frame
18	XBPSD40P06000	AA		C	Screw (4×6)
19	MSPRC6694RCZZ	AB		C	Bell spring
20	MLEVP6687RCZZ	AK		C	Bell hammer
21	XUPSD30P06000	AA		C	Screw (3×6)
23	MSPRK6698RCZZ	AB		C	Bill pressure spring
24	MLEV-6571RCN1	AD		C	Bill pressure lever
26	XBPSD40P06K00	AA		C	Screw (4×6K)
27	RALML6636RCZZ	AD		C	Bell
29	LX-NZ0070WRE0	AA		C	Nut
30	GLEGG6047RCZZ	AE		C	Rubber foot
31	MSPRC6693RCZZ	AD		C	Push out spring
32	LX-BZ6750RCZZ	AA		C	Screw
33	XNESD60-50000	AA		C	Nut (M6)
	XWSSD60-15000	AA		C	Washer (6mm)
34	LHLDW2091SCZZ	AD		C	Cable holder (CKN-07)
35	GLEGG6645RCZZ	AB		D	Stopper rubber
36	LX-BZ6751RCZZ	AA		C	Screw (M3)
37	LCHSS6666RCZA	AT		C	Bottom plate [KB]
	LCHSS6661RCZA	AT		C	Bottom plate [TQ,TR,TS]
38	GDRW-6666RCSA	BA		D	Drawer case [KB]
	GDRW-6665RCSA	BA		D	Drawer case [TQ,TR,TS]
39	MSPRK6669RCZZ	AD		C	Lock spring [TQ,TR,TS]
40	LKGiW6865RCZZ	AT		B	Drawer key (body) [TQ,TR,TS]
41	LKGiM6866RCZZ	AH		B	Drawer key [TQ,TR,TS]
43	LBNDJ5003BCZZ	AA		C	Band (SKB-1M)
44	GCASP6630RCZA	AY		D	Money case
46	LBRC-6656RCZZ	AL		C	Bracket (for 4B) (for 4B)
47	GCASP6020RCZZ	AH		C	Bill separetor
48	MSPRP6709RCZZ	AC		C	Earth spring
49	XFPSD30P06000	AA		C	Screw (3×6)
50	MSPRT6665RCZZ	AB		C	Open arm spring [KB]
51	LANGK7288RCZZ	AD		C	Open arm [KB]
52	XRESP40-06000	AA		C	E type ring (4mm) [KB]
53	XRESP30-06000	AA		C	E type ring (3mm) [KB]
54	GiTAU6626RCZZ	AN		C	Bill separator
55	MSPRT6664RCZZ	AB		C	Open key spring [KB]
56	LKGiW7263RCZZ	AN		B	Drawer lock (body) [KB]
57	LKGiM7264RCZZ	AH		B	Drawer key (2pcs)(for drawer lock) [KB]
58	XCTSD40P06000	AA		C	Screw (4×6)
59	PWiR-6627RCZZ	AK		C	Open wire [KB]
60	MSPRK6697RCZZ	AC		C	Key spring [KB]
101	GPAD-6626RCZZ	AC		D	Packing cushion for drawer box
501	CCASP6667RC01	BB		E	Money case(4B/8C)
502	DUNT-8677RCZZ	AN		E	Spring unit(with bell)
503	CLŌK-6657RC03	BC		E	Drawer lock unit (Include No.4,8~16,43)
	(Unit)				
901	GBŌXD7101RC03	BV	N	E	Drawer box unit [TQ,TR,TS]
	GBŌXD7101RC04	BW	N	E	Drawer box unit [KB]

3 Drawer box unit(SS460type)



4 Packing material & Accessories

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	SPAKC7996RCZZ	AU		D	Packing case	
2	SPAKA7985RCZZ	AQ		D	Packing cushion(Right)	
3	SSAKA2012KCZZ	AF		D	Vinyl bag (600×540×510)	
4	SPAKA7986RCZZ	AR		D	Packing cushion(Left)	
5	LKGiM7110RCZZ	AG		B	Mode switch key (MA)	
	LKGiM7111RCZZ	AG		B	Mode switch key (OP)	
	LKGiM7129RCZZ	AE		B	Mode switch key (SM)	
6	LKGiM7264RCZZ	AH		B	Drawer key (2pcs)(for drawer lock)	[KB]
	LKGiM6866RCZZ	AH		B	Drawer key	[TQ,TR,TS]
7	LKGiM6784RCZZ	AD		B	Printer cover key (1PC)	
8	SSAKH3012CCZZ	AA		D	Vinyl bag (80×120mm)	
9	UiNK-1001CCZZ	AK		S	Ink for stamp (5cc)	
10	TiNSE7249RCZZ	AQ	N	D	Instruction book	
	TiNSF7250RCZZ	AQ	N	D	Instruction book	[TQ,TR,TS]
	TiNSG7251RCZZ	AQ	N	D	Instruction book	[TQ,TR,TS]
	TiNSS7252RCZZ	AQ	N	D	Instruction book	[TQ,TR,TS]
13	SSAKH3015CCZZ	AA		D	Vinyl bag (260×360mm)	
14	PSHEK6779RCZZ	AD	N	C	Flat key sheet	
15	SSAKH4231CCZZ	AA		D	Vinyl bag (140×500mm)	
16	TCADH6654RCZZ	AB		C	Caution card	
17	TCAUS1054CCZZ	AB		C	Caution TAG	[KB]
101	UBNDA1008CCZZ	AA		C	AC cord band (120mm)	



RCP00104

5 Main PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	UBATN2183CCZZ	AV		B	Battery (151FT 3CELL)	[BT]
2	RALMB6640RCZZ	AF		B	Buzzer (SMX06)	[BZ1]
3	VCKYPU1HB331K	AA		C	Capacitor (50WV 330PF)	[C1]
4	VCKYPU1HB331K	AA		C	Capacitor (50WV 330PF)	[C2]
5	VCKYPU1HB102K	AA		C	Capacitor (50WV 1000PF)	[C3]
6	VCKYPU1HB102K	AA		C	Capacitor (50WV 1000PF)	[C4]
7	VCEAGU1CW106M	AA		C	Capacitor (16WV 10μF)	[C8]
8	VCEAGU1CW106M	AA		C	Capacitor (16WV 10μF)	[C9]
9	RC-KZ1054CCN2	AB		C	Capacitor (0.1μF)	[C10]
10	RC-KZ1054CCN2	AB		C	Capacitor (0.1μF)	[C11]
11	VCEAGU1CW106M	AA		C	Capacitor (16WV 10μF)	[C12]
12	RC-KZ1054CCN2	AB		C	Capacitor (0.1μF)	[C13]
13	RC-EZ106ARC1C	AD		C	Capacitor (16WV 10μF)	[C14]
14	RC-KZ1054CCN2	AB		C	Capacitor (0.1μF)	[C15]
15	RC-EZ106ARC1C	AD		C	Capacitor (16WV 10μF)	[C16]
16	VCKYPU1HB102K	AA		C	Capacitor (50WV 1000PF)	[C17]
17	RC-EZ685ARC1C	AD		C	Capacitor (16WV 6.8μF)	[C18]
18	VCQYNA1HM103K	AA		C	Capacitor (50WV 0.01μF)	[C19]
19	VCQYNA1HM103K	AA		C	Capacitor (50WV 0.01μF)	[C20]
20	VCKYPU1HB471K	AA		C	Capacitor (50WV 470pF)	[C22~26]
21	VCKYPU1HB331K	AA		C	Capacitor (50WV 330PF)	[C27]
22	VCKYPU1HB331K	AA		C	Capacitor (50WV 330PF)	[C28]
23	VCKYPU1HB331K	AA		C	Capacitor (50WV 330PF)	[C30~37]
24	VCKYPU1HB101K	AA		C	Capacitor (50WV 100pF)	[C38]
25	VCKYPU1HB101K	AA		C	Capacitor (50WV 100pF)	[C39]
26	VCKYPU1HB331K	AA		C	Capacitor (50WV 330PF)	[C40]
27	VCKYPU1HB102K	AA		C	Capacitor (50WV 1000PF)	[C41]
28	VCKYPU1HB102K	AA		C	Capacitor (50WV 1000PF)	[C43]
29	VCKYPU1HB331K	AA		C	Capacitor (50WV 330PF)	[C44~60]
30	VCKYPU1HB331K	AA		C	Capacitor (50WV 330PF)	[C61]
31	VCKYPU1HB331K	AA		C	Capacitor (50WV 330PF)	[C62]
32	VCKYPU1HB102K	AA		C	Capacitor (50WV 1000PF)	[C63]
33	VCKYPA1HB152K	AA		C	Capacitor (50WV 1500pF)	[C64]
34	VCKYPU1HB392K	AA		C	Capacitor (50WV 3900PF)	[C65]
35	VCKYPU1HB102K	AA		C	Capacitor (50WV 1000PF)	[C66]
36	VCQYNA1HM103K	AA		C	Capacitor (50WV 0.01μF)	[C67]
37	VCKYPU1HB102K	AA		C	Capacitor (50WV 1000PF)	[C68]
38	VCEAGU1HW227M	AC		C	Capacitor (50WV 220μF)	[C69]
39	VCEAGU2AW106M	AB		C	Capacitor (100WV 10μF)	[C71]
40	VCQYNU1HM683K	AB		C	Capacitor (50WV 0.068μF)	[C72]
41	VCKYPU1HB102K	AA		C	Capacitor (50WV 1000PF)	[C73]
42	VCQYNA1HM103K	AA		C	Capacitor (50WV 0.01μF)	[C74]
43	RC-KZ1054CCN2	AB		C	Capacitor (0.1μF)	[C76]
44	VCKYPU1HB331K	AA		C	Capacitor (50WV 330PF)	[C77~84]
45	VCEAGU1HW477M	AD		C	Capacitor (50WV 470μF)	[C85]
46	VCEAGU1HW105M	AA		C	Capacitor (50WV 1.0μF)	[C86]
47	VCEAGU2AW226M	AB		C	Capacitor (100WV 22μF)	[C87]
48	VCKYPU1HB331K	AA		C	Capacitor (50WV 330PF)	[C88~96]
49	VCEAGU1CW106M	AA		C	Capacitor (16WV 10μF)	[C97]
50	VCKYPU1HB331K	AA		C	Capacitor (50WV 330pF)	[C98]
51	VCKYPU1HB102K	AA		C	Capacitor (50WV 1000PF)	[C99]
52	VCEAGU1CW108M	AD		C	Capacitor (16WV 1000μF)	[C100]
53	VCKYPU1HB221K	AB		C	Capacitor (50WV 220PF)	[C101]
54	RC-KZ1054CCN2	AB		C	Capacitor (0.1μF)	[C102]
55	VCKYPU1HB331K	AA		C	Capacitor (50WV 330pF)	[C103~108]
56	RC-KZ1054CCN2	AB		C	Capacitor (0.1μF)	[C109]
57	VCEAGU1CW106M	AA		C	Capacitor (16WV 10μF)	[C110]
58	RC-KZ1054CCN2	AB		C	Capacitor (0.1μF)	[C111~114]
59	RC-EZ106ARC1A	AD		C	Capacitor (10WV 10μF)	[C115]
60	RC-EZ107BRC1A	AH		C	Capacitor (10WV 100μF)	[C116]
61	RC-EZ476ARC1A	AF		C	Capacitor (10WV 47μF)	[C117]
62	VHDDSS133HV-1	AA		B	Diode (DSS133HV)	[D1]
63	VHDDSS133HV-1	AA		B	Diode (DSS133HV)	[D2]
64	VHDDSS133HV-1	AA		B	Diode (DSS133HV)	[D3]
65	VHDEK04////-1	AD		B	Diode (EK04)	[D4]
66	VHDDSS133HV-1	AA		B	Diode (DSS133HV)	[D5]
67	VHDDSS133HV-1	AA		B	Diode (DSS133HV)	[D7]
68	VHEE102////-1	AC		B	Zener diode (E102)	[D8]
69	VHDDSS133HV-1	AA		B	Diode (DSS133HV)	[D9]
70	VHDDSS133HV-1	AA		B	Diode (DSS133HV)	[D10]
71	VHDDSS131HV-1	AA		B	Diode (DSS131HV)	[D11]
72	VHD1SS82///-1	AB		B	Diode (1SS82)	[D12]
73	VHD10DF1///-1	AD		B	Diode (10DF1)	[D13]
74	VHDDSS133HV-1	AA		B	Diode (DSS133HV)	[D14]
75	VHDDSS133HV-1	AA		B	Diode (DSS133HV)	[D15]
76	VHDDSS133HV-1	AA		B	Diode (DSS133HV)	[D16]
77	VHDDSS133HV-1	AA		B	Diode (DSS133HV)	[D17]
78	VHDDSS133HV-1	AA		B	Diode (DSS133HV)	[D18]
79	VHDEK04////-1	AD		B	Diode (EK04)	[D19]
80	QCNCM6926RC1H	AE		C	Connector (18pin)	[DISPCN]

5 Main PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
81	QCNCM6821RC0C	AC		B	Connector (3pin)	[DRCN1]
82	QCNCM6821RC0C	AC		B	Connector (3pin)	[DRCN2]
⚠ 83	QFS-A1037CCZZ	AC		A	Fuse (1.5A)(MINI TYPE)	[F1]
84	QFSHA1002CCZZ	AB		C	Fuse holder (MINI TYPE)	[F1]
⚠ 85	QFS-C4081CCZZ	AF		A	Fuse (250V 2.5A)	[F2]
86	QFSHA1002CCZZ	AB		C	Fuse holder (MINI TYPE)	[F2]
87	RFiLN6014RCZZ	AC	N	C	Filter (331I)	[FL1~8]
88	RCŌRF6673RCZZ	AB		C	Beads core (DR35C)	[FZ1]
89	RCŌRF6674RCZZ	AB		C	Beads core (SA39)	[FZ2]
90	VHiMC74HC00-1	AE		B	IC (TC74HC00)	[IC1]
91	VHiTD62503P-1	AG		B	IC (TD62503P)	[IC3]
92	QSŌCZ2042SC32	AE		C	IC socket (32pin)	[IC4]
93	QSŌCZ2042SC32	AE		C	IC socket (32pin)	[IC5]
94	VHi27010RAF1A	BF	N	B	IC (27010RAF1A)	[IC5]
95	QSŌCZ2042SC32	AE		C	IC socket (32pin)	[IC6]
96	VHiLH52250A90	AX		B	IC (LH52250A90)	[IC7]
97	VHiSMA4392/-1	AN		B	IC (SMA4392)	[IC9]
98	VHiSTA401A/-1	AP		B	IC (STA401A)	[IC10]
99	VHiiR9393//-1	AE		B	IC (IR9393)	[IC11]
100	VHiSTA401A/-1	AP		B	IC (STA401A)	[IC12]
101	VHiM54567P/-1	AK		B	IC (M54567P)	[IC13]
102	VHiiR9393//-1	AE		B	IC (IR9393)	[IC14]
103	VHiF258016PC/	AZ		B	IC (F258016PC)	[IC15]
104	VHiH6415108-6	BA		B	IC (H6415108-6)	[IC16]
105	VHiM54567P/-1	AK		B	IC (M54567P)	[IC17]
106	VHiiR3M03AV-1	AH		B	IC (IR3M03AV)	[IC18]
107	RCiLC6647RCZZ	AE		C	Coil (RCH-110)	[L1]
108	QCNCM7073RC6H	AM		C	Connector (68pin)	[OPTCN1]
109	QCNW-7518RCZZ	AR		C	Printer cable	[PRCN]
110	QCNCM1101CCZZ	AB		B	Connector (2pin)(5273-02A)	[PSCN]
111	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R5]
112	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R7]
113	VRD-RC2EY391J	AA		C	Resistor (1/4W 390Ω ±5%)	[R9]
114	VRD-RB2HY561J	AA		C	Resistor (1/2W 560Ω ±5%)	[R10]
115	VRD-RC2EY332J	AA		C	Resistor (1/4W 3.3KΩ ±5%)	[R15]
116	VRD-RC2EY623J	AA		C	Resistor (1/4W 62KΩ ±5%)	[R16]
117	VRD-RC2EY202J	AA		C	Resistor (1/4W 2.0KΩ ±5%)	[R17]
118	VRD-RC2EY102J	AA		C	Resistor (1/4W 1.0KΩ ±5%)	[R18]
119	VRD-RC2EY392J	AA		C	Resistor (1/4W 3.9KΩ ±5%)	[R19]
120	VRS-RE3AAR68J	AA		C	Resistor (1W 0.68Ω ±5%)	[R20]
121	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R21]
122	VRD-RC2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)	[R22]
123	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R23]
124	VRD-RC2EY330J	AA		C	Resistor (1/4W 33Ω ±5%)	[R24]
125	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R25]
126	VRD-RC2EY330J	AA		C	Resistor (1/4W 33Ω ±5%)	[R26]
127	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R27]
128	VRD-RC2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)	[R29~32]
129	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R33]
130	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R35]
131	VRD-RC2EY102J	AA		C	Resistor (1/4W 1.0KΩ ±5%)	[R36]
132	VRD-RC2EY102J	AA		C	Resistor (1/4W 1.0KΩ ±5%)	[R37]
133	VRD-RC2EY102J	AA		C	Resistor (1/4W 1.0KΩ ±5%)	[R38]
134	VRNRC2EK1303F	AA		C	Resistor (1/4W 130KΩ ±1%)	[R39]
135	VRD-RC2EY272J	AA		C	Resistor (1/4W 2.7KΩ ±5%)	[R40]
136	VRD-RC2EY333J	AA		C	Resistor (1/4W 33KΩ ±5%)	[R41]
137	VRD-RC2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)	[R42]
138	VRD-RC2EY102J	AA		C	Resistor (1/4W 1.0KΩ ±5%)	[R43]
139	VRD-RC2EY102J	AA		C	Resistor (1/4W 1.0KΩ ±5%)	[R44]
140	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R45]
141	VRD-RC2EY330J	AA		C	Resistor (1/4W 33Ω ±5%)	[R46~54]
142	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R55]
143	VRD-RC2EY272J	AA		C	Resistor (1/4W 2.7KΩ ±5%)	[R56]
144	VRD-RC2EY563J	AA		C	Resistor (1/4W 56KΩ ±5%)	[R57]
145	VRD-RC2EY563J	AA		C	Resistor (1/4W 56KΩ ±5%)	[R58]
146	VRD-RC2EY273J	AA		C	Resistor (1/4W 27KΩ ±5%)	[R59]
147	VRD-RC2EY104J	AA		C	Resistor (1/4W 100KΩ ±5%)	[R60]
148	VRD-RC2EY562J	AA		C	Resistor (1/4W 5.6KΩ ±5%)	[R61]
149	VRD-RC2EY182G	AA		C	Resistor (1/4W 1.8KΩ ±2%)	[R62]
150	VRD-RC2EY132G	AA		C	Resistor (1/4W 1.3KΩ ±2%)	[R63]
151	VRD-RC2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)	[R64]
152	VRD-RC2EY332J	AA		C	Resistor (1/4W 3.3KΩ ±5%)	[R65]
153	VRD-RC2EY203G	AA		C	Resistor (1/4W 20KΩ ±2%)	[R66]
154	VRD-RC2EY682J	AA		C	Resistor (1/4W 6.8KΩ ±5%)	[R67]
155	VRD-RC2EY101J	AA		C	Resistor (1/4W 100Ω ±5%)	[R68]
156	VRD-RC2EY562J	AA		C	Resistor (1/4W 5.6KΩ ±5%)	[R69]
157	VRD-RC2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)	[R70]
158	VRD-RC2EY622J	AA		C	Resistor (1/4W 6.2KΩ ±5%)	[R71]
159	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R72]
160	VRD-RC2EY562J	AA		C	Resistor (1/4W 5.6KΩ ±5%)	[R73]

5 Main PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
161	VRD-RC2EY102J	AA		C	Resistor (1/4W 1.0KΩ ±5%)	[R74]
162	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R75]
163	VRD-RC2EY101J	AA		C	Resistor (1/4W 100Ω ±5%)	[R76]
164	VRD-RC2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)	[R77]
165	VRD-RC2EY622J	AA		C	Resistor (1/4W 6.2KΩ ±5%)	[R78]
166	VRD-RC2EY101J	AA		C	Resistor (1/4W 100Ω ±5%)	[R79]
167	VRD-RC2EY562J	AA		C	Resistor (1/4W 5.6KΩ ±5%)	[R80]
168	VRD-RC2EY822G	AA		C	Resistor (1/4W 8.2KΩ ±2%)	[R81]
169	VRD-RC2EY912G	AA		C	Resistor (1/4W 9.1KΩ ±2%)	[R82]
170	VRD-RC2EY472G	AA		C	Resistor (1/4W 4.7KΩ ±1%)	[R83]
171	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R84]
172	VRD-RC2EY102J	AA		C	Resistor (1/4W 1.0KΩ ±5%)	[R85]
173	VRD-RC2EY102J	AA		C	Resistor (1/4W 1.0KΩ ±5%)	[R86]
174	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R87~90]
175	VRNRC2EK1201F	AA		C	Resistor (1/4W 1.2KΩ ±1%)	[R91]
176	VRNRC2EK1002F	AA		C	Resistor (1/4W 10KΩ ±1%)	[R92]
177	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R93]
178	VRD-RC2EY102J	AA		C	Resistor (1/4W 1.0KΩ ±5%)	[R94]
179	VRD-RC2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)	[R95]
180	VRNRC2EK1201F	AA		C	Resistor (1/4W 1.2KΩ ±1%)	[R96]
181	VRNRC2EK3601F	AA		C	Resistor (1/4W 3.6KΩ ±5%)	[R97]
182	VRD-RC2EY100J	AA		C	Resistor (1/4W 10Ω ±5%)	[R98]
183	VRD-RC2EY220J	AA		C	Resistor (1/4W 22Ω ±5%)	[R99]
184	VRD-RC2EY473J	AA		C	Resistor (1/4W 47KΩ ±5%)	[R100]
185	RMPTC9103QCKB	AC		B	Block resistor (10KΩ×9 1/8W ±10%)	[RA1]
186	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[RA2]
187	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[RA3]
188	RMPTC8102QCKB	AD		B	Block resistor (1KΩ×8 1/8W ±10%)	[RA4]
189	RMPTC4103QCKB	AC		B	Block resistor (10KΩ×4 1/8W ±10%)	[RA5]
190	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[RA6]
191	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[RA7]
192	RMPTC5103QCKB	AC		B	Block resistor (10KΩ×5 1/8W ±10%)	[RA8]
193	RMPTC6103QCKB	AC		B	Block resistor (10KΩ×6 1/8W ±10%)	[RA9]
194	QCNCM1060AC03	AB		B	Connector (3pin)	[SCN]
195	QCNCW1057ACZZ	AB		C	Connector (Short socket)	[SCN]
196	QCNCW1084ACZZ	AG		C	Connector (9pin)	[SIOCN]
197	QCNCM6865RC2J	AD		C	Connector (20pin)	[SLIPCN1]
198	QCNCM2379RC0E	AC		C	Connector (5pin)	[SLIPCN2]
⚠ 199	RTRNH9515RCZZ	AF	N	B	Converter transformer	[T1]
200	VRD-RC2EY000J	AA		C	Resistor (1/4W 0Ω ±5%)	[TP3]
201	VSJC501-///-1	AB		B	Transistor (JC501)	[TR2]
202	VSJA101-///-1	AB		B	Transistor (JA101)	[TR3]
203	VS2SA673-//-1	AD		B	Transistor (2SA673)	[TR4]
204	VSJC501-///-1	AB		B	Transistor (JC501)	[TR5]
205	VS2SD667-//-1	AD		B	Transistor (2SD667)	[TR6]
206	VS2SC4153-/-1	AG		B	Transistor (2SC4153)	[TR7]
207	VS2SC4153-/-1	AG		B	Transistor (2SC4153)	[TR8]
208	RVR-M2517QCZZ	AE		B	Variable resistor (200KΩ)	[VR2]
209	RCRSP6661RCZZ	AD		B	Crystal (9.830MHz)	[XTAL1]
210	VHERD4.3EL1-1	AA		B	Zener diode (RD4.3EL1)	[ZD1]
211	VHERD39EB3/-1	AC		B	Zener diode (RD39EB3)	[ZD2]
212	VHERD4.3EL1-1	AA		B	Zener diode (RD4.3EL1)	[ZD3]
213	VHERD6.2EB1-1	AB		B	Zener diode (RD6.2EB1)	[ZD4]
214	VHERD5.6FB3-1	AC		B	Zener diode (RD5.6FB3)	[ZD5]
215	LBNDJ0004UCZZ	AA		C	Band	
216	PRDAF6650RCZZ	AG		C	Heat sink A	
217	QCNW-7124RCZZ	AB		C	GND wire 2	
218	QCNW-7583RCZZ	AE		C	GND wire 1	
219	QCNW-7584RCZZ	AC		C	GND wire 2	
220	XBPSD30P08KS0	AA		C	Screw (3×8KS)	
221	XBPSD30P08000	AA		C	Screw (3×8)	
222	XBSSD30P08000	AA		C	Screw (3×8)	
223	XNESD30-24000	AA		C	Nut (3NS)	
	(Unit)					
901	CPWBF7287RC02	CG	N	E	Main PWB unit	

6 Display PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	RC-KZ1054CCZZ	AB		C	Capacitor (50WV 0.1μF)	[C1]
2	RC-KZ1054CCZZ	AB		C	Capacitor (50WV 0.1μF)	[C2]
3	VCEAEU1CW106M	AA		C	Capacitor (16WV 10μF)	[C3]
4	VCKYPU1HB471K	AA		C	Capacitor (50WV 470pF)	[C4]
5	VCKYPU1HB471K	AA		C	Capacitor (50WV 470pF)	[C5]
6	VCKYPU1HB102K	AA		C	Capacitor (50WV 1000PF)	[C6]
7	VCKYPU1HB471K	AA		C	Capacitor (50WV 470pF)	[C7]

6 Display PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
8	VCKYPU1HB471K	AA		C	Capacitor (50WV 470pF)	[C8]
9	VCKYPU1HB102K	AA		C	Capacitor (50WV 1000PF)	[C9]
10	VCKYPU1HB471K	AA		C	Capacitor (50WV 470pF)	[C10]
11	VCKYPU1HB471K	AA		C	Capacitor (50WV 470pF)	[C11]
12	RC-KZ1054CCZZ	AB		C	Capacitor (50WV 0.1μF)	[C12]
13	VCCCPU1HH150J	AA		C	Capacitor (50WV 15pF)	[C13]
14	VCCCPU1HH150J	AA		C	Capacitor (50WV 15pF)	[C14]
15	RC-EZ106ARC1A	AD		C	Capacitor (10WV 10μF)	[C15]
16	RC-EZ106ARC1A	AD		C	Capacitor (10WV 10μF)	[C16]
17	VCKYPU1HB681K	AA		C	Capacitor (50WV 680PF)	[C17]
18	VHDEK04////-1	AD		B	Diode (EK04)	[D1]
19	QCNW-7456RCZZ	AQ		C	Display cable (18pin)	[DISPCN]
20	VHiH4728A20FS	AV		B	IC (H4728A20FS)	[IC1]
21	QCNW-7454RCZA	AH		C	Key cable (7pin)	[KEYCN1]
22	QCNW-7455RCZZ	AK		C	Key cable 2 (9pin)	[KEYCN2]
23	QCNCM6865RC0i	AC		C	Connector (9pin)	[POP UP CN1]
24	QCNCM6865RC1A	AD		C	Connector (11pin)	[POP UP CN2]
25	VRD-RC2EY221J	AA		C	Resistor (1/4W 220Ω ±5%)	[R1]
26	VRD-RC2EY105J	AA		C	Resistor (1/4W 1.0MΩ ±5%)	[R2]
27	VRD-RC2EY000J	AA		C	Resistor (1/4W 0Ω ±5%)	[R6]
28	VRD-RC2EY000J	AA		C	Resistor (1/4W 0Ω ±5%)	[R7]
29	RMPTC8104QCKB	AD		B	Block resistor (100KΩ×8 1/8W ±10%)	[RA1]
30	RMPTCB104QCKB	AE		B	Block resistor (100KΩ×12 1/8W ±10%)	[RA2]
31	RCRSZ6644RCZZ	AD		B	Crystal (4.19MHz)	[X1]
32	RCRSP6658RCZZ	AE		B	Crystal (32.768KHz)	[X2]
33	LBNDJ0004UCZZ	AA		C	Band	
34	PSPAG6716RCZZ	AC		C	Display spacer	
35	VVK11MT77GK-1	AY		B	Display tube	
	(Unit)					
901	CPWBF7289RCS1	BM		E	Display PWB unit	

7 Power supply PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	RC-EZ688NRC1J	AQ		C	Capacitor (63WV 6800μF)	[C1]
2	VCEAGU1VW228M	AG		C	Capacitor (35WV 2200μF)	[C2]
3	VCQYNA2AM103K	AA		C	Capacitor (100WV 0.010μF)	[C3]
4	VHDDBA20B//-1	AE		B	Diode (DBA20B)	[DB1]
⚠ 5	QFS-C2521TAZZ	AE		A	Fuse (250V 2.5A)	[F1]
6	VHiSTR2024/-1	AR		B	IC (STR2024)	[IC1]
7	RCiLC6652RCZZ	AK		C	Coil (MC182-201M)	[L1]
8	QCNW-7575RCZZ	AE		C	PS cable (2pin)	[PSCN]
9	VRD-RC2EY273G	AA		C	Resistor (1/4W 27KΩ ±2%)	[R1]
10	QCNCM1101CCZZ	AB		B	Connector (2pin)(5273-02A)	[VIN CN]
11	PRDAF6651RCZZ	AG		C	Heat sink B	
12	QFSHA1002CCZZ	AB		C	Fuse holder (MINI TYPE)	
13	XBPSD30P08KS0	AA		C	Screw (3×8KS)	
14	XBPSD30P14KS0	AA		C	Screw (3×14KS)	
15	XNESD30-24000	AA		C	Nut (3NS)	
	(Unit)					
901	CPWBF7290RC02	BL	N	E	Power supply PWB unit	

8 Noise filter PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	RC-EZD104RC2E	AD		C	Capacitor (250WV 0.1μF)	[C1]
2	RC-EZD224RC2E	AE		C	Capacitor (250WV 0.22μF)	[C2]
3	RCiLC6638RCZZ	AM		C	Coil	[L1]
4	RCiLC6575RCZZ	AN		C	Coil	[L2]
5	VRD-RB2HY394J	AA		C	Resistor (1/2W 390KΩ ±5%)	[R1]
6	QCNW-7356RCZZ	AF		C	PS cable	
⚠ 7	QFS-C1322QCZZ	AE		A	Fuse (250V 1A)	
8	QFSHA1002CCZZ	AB		C	Fuse holder (MINI TYPE)	
⚠ 9	RTRNP9514RCZZ	AZ	N	B	Power transformer	
	(Unit)					
901	CPWBF7288RC01	BM	N	E	Noise filter PWB unit	[TQ,TR,TS]
	CPWBF7288RC02	BM	N	E	Noise filter PWB unit	[KB]

9 Customer display PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	LBNDJ0004UCZZ	AA		C	Band
2	QCNCW6918RC09	AH		C	Connector with wires (9pin) [Pop up CN1]
3	QCNCW6918RC11	AK		C	Connector with wires (11pin) [Pop up CN2]
4	VVKH9MT10Z/-1	AY		B	Display tube (H9MT10Z)
	(Unit)				
901	CPWBF7151RC01	BD		E	Customer display PWB unit

10 Articles for consumption

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	DPAPR1006CSZZ	AR		S	Roll paper
2	PRBN-6640RCZZ	AX		S	Ribbon cassette
3	UiNK-1001CCZZ	AK		S	Ink for stamp (5cc)

11 Special service tools and service options

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	LKGiM7113RCZZ	AK		B	Service key
2	LKGiM7126RCZZ	AL		B	Mode key grip cover
3	GCŌVB7047RCZZ	BA		S	Key switch cover A
4	PSHEK6777RCZZ	AC		S	Key sheet(blank)
5	DKiT-8633RCZZ	BE		S	Dramer fixing kit (Include No.11~16)
6	DKiT-8643RCZZ	BG		S	Near end sensor unit (Include No.21~26)
7	CKŌG-6708RCZZ	BU		S	Expansion PWB (for ER-A5IN/A5RS)
8	UKŌG-6704RCZZ	AV		S	Loop back connector for SIO
9	UKŌG-6705RCZZ	BC		S	Loop back conector (for ER-A5IN/A5RS)
11	LBRC-2321RCZZ	AN		S	Fixing bracket
12	XTPSD40P16000	AA		C	Screw (4×16)
13	XBSSD40P16000	AA		C	Screw (4×16)
14	XUSSD40P20000	AA		C	Screw (4×20)
15	XBPSD40P22000	AA		C	Screw (4×22)
16	XNESD40-32000	AA		C	Nut
21	DUNTK8296RCZZ	BC		S	Near end sensor
22	QCNW-7049RCZZ	AD		C	Ground wire
23	LX-BZ6773RCZZ	AA		C	Screw
24	XBPSD30P04KS0	AA		C	Screw (3×4KS)
25	XBPSD40P06KS0	AA		C	Screw (4×6KS)
26	XWHSD30-05080	AA		C	Washer

12 AC CORD

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
⚠ 1	QACCJ1413QCZZ	AG		B	AC cord Japan, RB6, RB7, RC5, SC, SD
⚠	QACCA3441QCZZ	AL		B	AC cord SB
⚠ 2	QACCD8411QCZZ	AN		B	AC cord U. S. A, Canada, Japan (Okinawa), Guam
⚠ 3	QACCE1422QCZZ	AP		B	AC cord RA1, RA2, RB3, RB5, SG, TQ, TR, TS, K AC cord Yugoslavia
⚠ 4	QPLGA4501CCZZ	AK		B	Plug SE
⚠	QCNW-6629RCZZ	AN		B	AC cord SE
⚠ 5	QPLGA0018WRE0	AN		B	Plug SH, RA5
⚠	QCNW-6629RCZZ	AN		B	AC cord SH, RA5, SHE
⚠	PHOG-1023CCZZ	AB		B	Bushing for AC cord SH, RA5, SHE
⚠ 6	QACCL7421QCZZ	AS		B	AC cord KA, SL
7	QTANP0004HCZZ	AB		B	Lug terminal RC2, SM, SMT, RC1, SBA, RB8
	QPLGA0006QCZZ	AN		B	Plug KB, SM, SMT, RC1, SBA, RB8, RC2
	QCNW-7212RCZZ	AH		B	AC cord KB, RC1, RC2, SM, SMT, SBA
⚠	QCNW-6629RCZZ	AN		B	AC cord RB8
⚠ 8	QCNW-6629RCZZ	AN		B	AC cord RB4 (AC cord only. The plug is not included.)
⚠ 9	QACCZ3423QCZZ	AH		B	AC cord SJ, SJ2

Note : Instead of AC cords QACCZ3421QCZZ/QACCK1008CCZZ, the AC cord QACCE1422QCZZ(No.3) is supllied as service spare part.

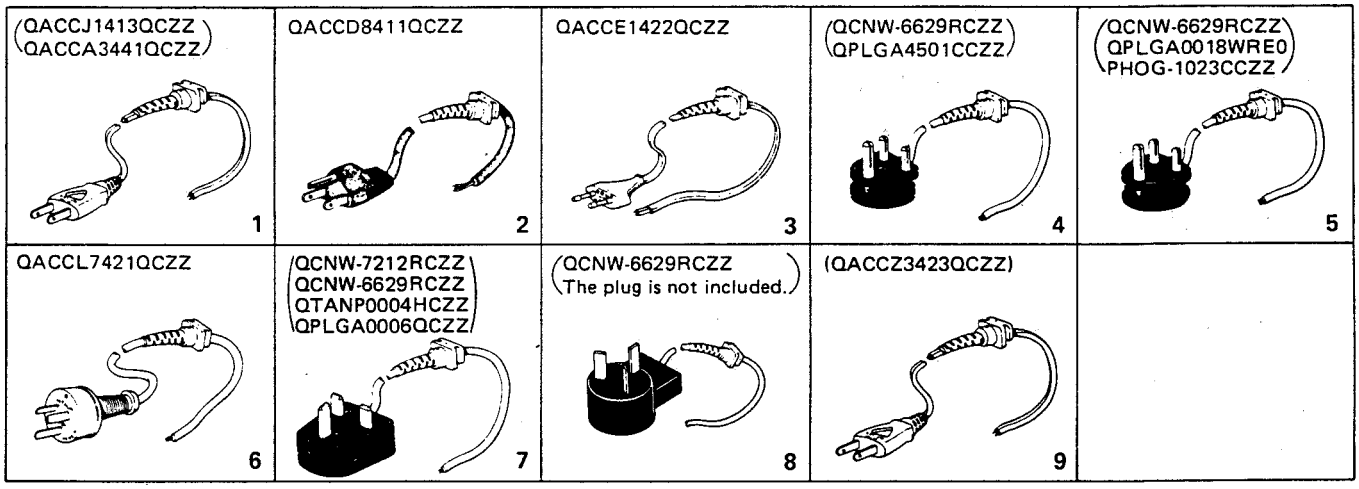


Table of destinations

SELECTION CODE	COUNTRIES
U	U. S. A., Guam
A	Canada
TS	Germany
TQ	SEEG territory other than Germany (Stamp : English)
TR	SEEG territory other than Germany (Stamp : Spanish)
KB	U. Kingdom
KA	Australia

SELECTION CODE	COUNTRIES
K	Korea

SELECTION CODE	COUNTRIES
SB	Saudi Arabia (127V area)
SBA	Saudi Arabia (220V area)
SC	Taiwan
SD	Venezuela
SE	Hong Kong
SG	Lebanon, Syria, Greece, Pakistan, Iran, Egypt, Thailand, Iraq, Mauritius, Seychelles, Tahiti, Jordan, Sudan, Turkey
SH	South Africa (U. S. A. version)
SHE	South Africa (Europe version)
SJ	Philippines (Europe version)
SJ2	Philippines (U. S. A. version)
SM	Kuwait, Qatar, Oman, UAE, Malta, Bahrain
SMT	Nigeria, Yemen, Kenya

SELECTION CODE	COUNTRIES
RA1	Morocco, Algeria, Tunisia, West Africa
RA2	Chile, Uruguay, Peru, Argentina, Paraguay
RA5	Sri Lanka

SELECTION CODE	COUNTRIES
RB3	Indonesia
RB4	
RB5	Cyprus
RB6	Panama
RB7	Barbados
RB8	Malaysia (U. S. A. version)

SELECTION CODE	COUNTRIES
RC1	Malaysia (Europe version)
RC2	Singapore
RC5	Dominican Republic, Ecuador

■ Index

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
[C]					
CCASP6667RC01	3- 501	BB		E	
CKOG-6708RCZZ	11- 7	BU		S	
CLOK-6657RC03	3- 503	BC		E	
CPWBF7151RC01	1- 5	BD		E	
//	9- 901	BD		E	
CPWBF7287RC02	2- 23	CG	N	E	
//	5- 901	CG	N	E	
CPWBF7288RC01	2- 2	BM	N	E	
//	8- 901	BM	N	E	
CPWBF7288RC02	2- 2	BM	N	E	
//	8- 901	BM	N	E	
CPWBF7289RCS1	1- 15	BM		E	
//	6- 901	BM		E	
CPWBF7290RC02	2- 24	BL	N	E	
//	7- 901	BL	N	E	
CSW-P6875RC01	1- 30	AW		B	
CSW-S6850RC01	1- 28	AH		B	
[D]					
DKiT-8633RCZZ	11- 5	BE		S	
DKiT-8643RCZZ	11- 6	BG		S	
DPAPR1006CSZZ	10- 1	AR		S	
DUNT-8677RCZZ	3- 502	AN		E	
DUNTK8296RCZZ	11- 21	BC		S	
DUNTK9161RCZZ	1- 501	BL		E	
DUNTM8517RCZZ	3- 14	AN		C	
[G]					
GBOXD7101RC03	3- 901	BV	N	E	
GBOXD7101RC04	3- 901	BW	N	E	
GCAB-7143RCZZ	1- 4	AH		D	
GCABA7142RCSB	2- 30	BD	N	D	
GCABB7141RCSA	1- 9	AY		D	
GCABM7146RCZZ	3- 5	BK		D	
GCABM7152RCZZ	3- 5	BL	N	D	
GCASP6020RCZZ	3- 47	AH		C	
GCASP6630RCZA	3- 44	AY		D	
GCOVA7038RCSA	1- 1	AP		D	
GCOVA7039RCSA	1- 3	AM		D	
GCOVA7040RCSA	2- 31	AQ		D	
GCOVB7041RCZZ	1- 14	AY		D	
GCOVB7042RCZZ	1- 12	AW		D	
GCOVB7047RCZZ	11- 3	BA		S	
GDRW-6665RCSA	3- 38	BA		D	
GDRW-6666RCSA	3- 38	BA		D	
GFTAF6770RCSA	2- 40	AC		D	
GFTAS6769RCSA	2- 29	AC		D	
GiTAU6626RCZZ	3- 54	AN		C	
GLEGG6047RCZZ	3- 30	AE		C	
GLEGG6645RCZZ	3- 35	AB		D	
GPAD-6626RCZZ	3- 101	AC		D	
[H]					
HPNLC6818RCSB	1- 11	AH		D	
[K]					
Ki-OB6754RCZZ	2- 3	CB		E	
[L]					
LANGK7288RCZZ	3- 51	AD		C	
LANGQ7472RCZZ	2- 22	AE		C	
LANGQ7476RCZZ	2- 11	AF		C	
LANGT7465RCZZ	1- 23	AK		C	
LANGT7469RCZZ	1- 16	AL		C	
LBNDJ0004UCZZ	1- 38	AA		C	
//	2- 50	AA		C	
//	5- 215	AA		C	
//	6- 33	AA		C	
//	9- 1	AA		C	
LBNDJ2004SCZZ	1- 46	AA		C	
LBNDJ5003BCZZ	3- 43	AA		C	
LBRC-2321RCZZ	11- 11	AN		S	
LBRC-6656RCZZ	3- 46	AL		C	
LBSHZ2021HCZZ	2- 48	AA		C	
LCHSM6692RCZZ	2- 39	AV		C	
LCHSS6661RCZA	3- 37	AT		C	
LCHSS6666RCZA	3- 37	AT		C	
LFRM-6667RCZZ	3- 17	AF		C	
LHLDK6813RCSA	2- 15	AE		D	
LHLDW0004SCZZ	1- 34	AB		C	
LHLDW0007SCZZ	2- 18	AA		C	
LHLDW0008SCZZ	2- 26	AA		C	
LHLDW0024SCZZ	1- 31	AA		C	
//	2- 28	AA		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
LHLDW0024SCZZ	3- 3	AA		C	
LHLDW2091SCZZ	3- 34	AD		C	
LHLDW2341RCZZ	2- 52	AB		C	
LHLDW5034BCZZ	1- 44	AB		C	
LKGiM6784RCZZ	2- 37	AD		B	
//	4- 7	AD		B	
LKGiM6866RCZZ	3- 41	AH		B	
//	4- 6	AH		B	
LKGiM7110RCZZ	1- 24	AG		B	
//	4- 5	AG		B	
LKGiM7111RCZZ	1- 24	AG		B	
//	4- 5	AG		B	
LKGiM7113RCZZ	11- 1	AK		B	
LKGiM7126RCZZ	11- 2	AL		B	
LKGiM7129RCZZ	1- 24	AE		B	
//	4- 5	AE		B	
LKGiM7264RCZZ	3- 57	AH		B	
//	4- 6	AH		B	
LKGiW2363RCZZ	2- 34	AL		B	
LKGiW6865RCZZ	3- 40	AT		B	
LKGiW7256RCZZ	1- 25	AP		B	
LKGiW7263RCZZ	3- 56	AN		B	
LX-BZ6665RCZZ	1- 17	AA		C	
LX-BZ6750RCZZ	3- 32	AA		C	
LX-BZ6751RCZZ	3- 36	AA		C	
LX-BZ6773RCZZ	11- 23	AA		C	
LX-BZ6774RCZZ	1- 33	AA		C	
//	2- 7	AA		C	
LX-NZ0070WRE0	3- 29	AA		C	
LX-WZ0052FCZZ	3- 2	AA		C	
[M]					
MLEV-6571RCN1	3- 24	AD		C	
MLEVP6687RCZZ	3- 20	AK		C	
MSPRC6693RCZZ	3- 31	AD		C	
MSPRC6694RCZZ	3- 19	AB		C	
MSPRK6660RCZZ	2- 36	AC		C	
MSPRK6669RCZZ	3- 39	AD		C	
MSPRK6697RCZZ	3- 60	AC		C	
MSPRK6698RCZZ	3- 23	AB		C	
MSPRP6709RCZZ	3- 48	AC		C	
MSPRT6664RCZZ	3- 55	AB		C	
MSPRT6665RCZZ	3- 50	AB		C	
MSPRT6695RCZZ	3- 16	AB		C	
[N]					
NROLP6643RCZZ	3- 6	AE		C	
[P]					
PCUSG1220CCZZ	2- 9	AB		D	
PFiLW6923RCSB	1- 6	AN	N	D	
PFiLW6924RCSB	1- 10	AM	N	D	
PFiLW6925RCZZ	1- 2	AK		D	
PFiLW6926RCZZ	1- 47	AD		D	
PGUMM6659RCZZ	3- 7	AB		C	
PGUMM6699RCZZ	2- 5	AB		C	
PMAGE6631RC01	3- 13	AQ		B	
PRBN-6640RCZZ	10- 2	AX		S	
PRDAF6650RCZZ	5- 216	AG		C	
PRDAF6651RCZZ	7- 11	AG		C	
PSHEK6777RCZZ	11- 4	AC		S	
PSHEK6778RCZZ	1- 13	AK	N	C	
PSHEK6779RCZZ	4- 14	AD	N	C	
PSHEP6789RCZZ	2- 13	AG	N	C	
PSHEZ6735RCZZ	3- 10	AB		C	
PSPAG6703RCZZ	1- 7	AB		C	
PSPAG6716RCZZ	6- 34	AC		C	
PSTM-6780RCZZ	2- 4	AR		C	
PSTM-6782RCZZ	2- 4	AS		C	
PSTM-6785RC01	2- 4	AS		C	
PWiR-6627RCZZ	3- 59	AK		C	
[Q]					
QACCE3120QCN5	2- 16	AL		B	
QCNCM1060AC03	5- 194	AB		B	
QCNCM1101CCZZ	5- 110	AB		B	
//	7- 10	AB		B	
QCNCM2379RC0E	5- 198	AC		C	
QCNCM6821RC0C	5- 81	AC		B	
//	5- 82	AC		B	
QCNCM6865RC0i	6- 23	AC		C	
QCNCM6865RC1A	6- 24	AD		C	
QCNCM6865RC2J	5- 197	AD		C	
QCNCM6926RC1H	5- 80	AE		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
QCNCM7073RC6H	5- 108	AM		C	
QCNCW1057ACZZ	5- 195	AB		C	
QCNCW1084ACZZ	5- 196	AG		C	
QCNCW6918RC09	9- 2	AH		C	
QCNCW6918RC11	9- 3	AK		C	
QCNW-6637RCZZ	3- 11	AB		C	
QCNW-7049RCZZ	11- 22	AD		C	
QCNW-7120RCZZ	1- 39	AE		C	
QCNW-7122RCZZ	2- 10	AD		C	
QCNW-7124RCZZ	5- 217	AB		C	
QCNW-7125RCZZ	2- 8	AD		C	
QCNW-7212RCZZ	2- 16	AH		B	
QCNW-7356RCZZ	8- 6	AF		C	
QCNW-7434RCZZ	1- 29	AC		C	
QCNW-7454RCZA	6- 21	AH		C	
QCNW-7455RCZZ	6- 22	AK		C	
QCNW-7456RCZZ	1- 36	AQ		C	
〃	6- 19	AQ		C	
QCNW-7518RCZZ	2- 43	AR		C	
〃	5- 109	AR		C	
QCNW-7575RCZZ	2- 42	AE		C	
〃	7- 8	AE		C	
QCNW-7579RCZZ	3- 4	AH		C	
QCNW-7583RCZZ	5- 218	AE		C	
QCNW-7584RCZZ	5- 219	AC		C	
QCNW-7590RCZZ	2- 53	AC	N	C	
QCNW-7591RCZZ	2- 54	AE	N	C	
QCNW-7592RCZZ	2- 41	AD	N	C	
QFS-A1037CCZZ	5- 83	AC		A	
QFS-C1322QCZZ	8- 7	AE		A	
QFS-C2521TAZZ	7- 5	AE		A	
QFS-C4081CCZZ	5- 85	AF		A	
QFSHA1002CCZZ	5- 84	AB		C	
〃	5- 86	AB		C	
〃	7- 12	AB		C	
〃	8- 8	AB		C	
QPLGA0006QCZZ	2- 16	AQ		C	
QSOCZ2042SC32	5- 92	AE		C	
〃	5- 93	AE		C	
〃	5- 95	AE		C	
QSW-C9212QCZZ	2- 17	AH		B	
QSW-M2128SCZZ	3- 9	AG		B	
QTANN6629RCZZ	2- 14	AF		C	
QTANP0004HCZZ	2- 20	AB		C	
〔R〕					
RALMB6640RCZZ	5- 2	AF		B	
RALML6636RCZZ	3- 27	AD		C	
RC-EZD104RC2E	8- 1	AD		C	
RC-EZD224RC2E	8- 2	AE		C	
RC-EZ106ARC1A	5- 59	AD		C	
〃	6- 15	AD		C	
〃	6- 16	AD		C	
RC-EZ106ARC1C	5- 13	AD		C	
〃	5- 15	AD		C	
RC-EZ107BRC1A	5- 60	AH		C	
RC-EZ476ARC1A	5- 61	AF		C	
RC-EZ685ARC1C	5- 17	AD		C	
RC-EZ688NRC1J	7- 1	AQ		C	
RC-KZ1054CCN2	5- 9	AB		C	
〃	5- 10	AB		C	
〃	5- 12	AB		C	
〃	5- 14	AB		C	
〃	5- 43	AB		C	
〃	5- 54	AB		C	
〃	5- 56	AB		C	
〃	5- 58	AB		C	
RC-KZ1054CCZZ	6- 1	AB		C	
〃	6- 2	AB		C	
〃	6- 12	AB		C	
RCiLC6575RCZZ	8- 4	AN		C	
RCiLC6638RCZZ	8- 3	AM		C	
RCiLC6647RCZZ	5- 107	AE		C	
RCiLC6652RCZZ	7- 7	AK		C	
RCORF1016LCZZ	1- 20	AL		C	
RCORF5003SCZZ	1- 18	AK		C	
RCORF6654RCZZ	1- 32	AH		C	
RCORF6661RCZZ	2- 45	AK		C	
RCORF6662RCZZ	1- 45	AK		C	
RCORF6666RCZZ	2- 25	AM		C	
RCORF6673RCZZ	5- 88	AB		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
RCORF6674RCZZ	5- 89	AB		C	
RCORF6682RCZZ	2- 47	AE	N	C	
RCORF7001SCZZ	2- 49	AL		C	
RCRSP6658RCZZ	6- 32	AE		B	
RCRSP6661RCZZ	5- 209	AD		B	
RCRSZ6644RCZZ	6- 31	AD		B	
RFiLN6014RCZZ	5- 87	AC	N	C	
RMPTCB104QCKB	6- 30	AE		B	
RMPTC0473QCKB	1- 108	AD		B	
RMPTC4103QCKB	5- 189	AC		B	
RMPTC5103QCKB	5- 192	AC		B	
RMPTC6103QCKB	5- 193	AC		B	
RMPTC8102QCKB	5- 188	AD		B	
RMPTC8103QCKB	5- 186	AD		B	
〃	5- 187	AD		B	
〃	5- 190	AD		B	
〃	5- 191	AD		B	
RMPTC8104QCKB	6- 29	AD		B	
RMPTC9103QCKB	5- 185	AC		B	
RTRNH9515RCZZ	5- 199	AF	N	B	
RTRNP9514RCZZ	8- 9	AZ	N	B	
RVR-M2517QCZZ	5- 208	AE		B	
〔S〕					
SPAKA7985RCZZ	4- 2	AQ		D	
SPAKA7986RCZZ	4- 4	AR		D	
SPAKC7996RCZZ	4- 1	AU		D	
SSAKA2012KCZZ	4- 3	AF		D	
SSAKH3012CCZZ	4- 8	AA		D	
SSAKH3015CCZZ	4- 13	AA		D	
SSAKH4231CCZZ	4- 15	AA		D	
〔T〕					
TCADH6654RCZZ	4- 16	AB		D	
TCAUS1054CCZZ	4- 17	AB		C	
TCAUS6668RCZZ	1- 37	AA		D	
TiNSE7249RCZZ	4- 10	AQ	N	D	
TiNSF7250RCZZ	4- 10	AQ	N	D	
TiNSG7251RCZZ	4- 10	AQ	N	D	
TiNSS7252RCZZ	4- 10	AQ	N	D	
TLAB-4681CCZZ	2- 21	AA		C	
〔U〕					
UBATN2183CCZZ	5- 1	AV		B	
UBNDA1008CCZZ	4- 101	AA		C	
UiNK-1001CCZZ	4- 9	AK		S	
〃	10- 3	AK		S	
UKOG-6704RCZZ	11- 8	AV		S	
UKOG-6705RCZZ	11- 9	BC		S	
〔V〕					
VCCCPU1HH150J	6- 13	AA		C	
〃	6- 14	AA		C	
VCEAEU1CW106M	6- 3	AA		C	
VCEAGU1CW106M	5- 7	AA		C	
〃	5- 8	AA		C	
〃	5- 11	AA		C	
〃	5- 49	AA		C	
〃	5- 57	AA		C	
VCEAGU1CW108M	5- 52	AD		C	
VCEAGU1CW336M	1- 113	AA		C	
VCEAGU1HW105M	5- 46	AA		C	
VCEAGU1HW227M	5- 38	AC		C	
VCEAGU1HW477M	5- 45	AD		C	
VCEAGU1VW228M	7- 2	AG		C	
VCEAGU2AW106M	5- 39	AB		C	
VCEAGU2AW226M	5- 47	AB		C	
VCKYPA1HB152K	5- 33	AA		C	
VCKYPU1HB101K	5- 24	AA		C	
〃	5- 25	AA		C	
VCKYPU1HB102K	5- 5	AA		C	
〃	5- 6	AA		C	
〃	5- 16	AA		C	
〃	5- 27	AA		C	
〃	5- 28	AA		C	
〃	5- 32	AA		C	
〃	5- 35	AA		C	
〃	5- 37	AA		C	
〃	5- 41	AA		C	
〃	5- 51	AA		C	
〃	6- 6	AA		C	
〃	6- 9	AA		C	
VCKYPU1HB221K	5- 53	AB		C	
VCKYPU1HB331K	5- 3	AA		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
VCKYPU1HB331K	5- 4	AA		C	
〃	5- 21	AA		C	
〃	5- 22	AA		C	
〃	5- 23	AA		C	
〃	5- 26	AA		C	
〃	5- 29	AA		C	
〃	5- 30	AA		C	
〃	5- 31	AA		C	
〃	5- 44	AA		C	
〃	5- 48	AA		C	
〃	5- 50	AA		C	
〃	5- 55	AA		C	
VCKYPU1HB392K	5- 34	AA		C	
VCKYPU1HB471K	5- 20	AA		C	
〃	6- 4	AA		C	
〃	6- 5	AA		C	
〃	6- 7	AA		C	
〃	6- 8	AA		C	
〃	6- 10	AA		C	
〃	6- 11	AA		C	
VCKYPU1HB681K	6- 17	AA		C	
VCQYNA1HM103K	5- 18	AA		C	
〃	5- 19	AA		C	
〃	5- 36	AA		C	
〃	5- 42	AA		C	
VCQYNA2AM103K	7- 3	AA		C	
VCQYNU1HM683K	5- 40	AB		C	
VHDDBA20B//-1	7- 4	AE		B	
VHDDSS131HV-1	5- 71	AA		B	
VHDDSS133//-1	1- 111	AA		B	
VHDDSS133HV-1	5- 62	AA		B	
〃	5- 63	AA		B	
〃	5- 64	AA		B	
〃	5- 66	AA		B	
〃	5- 67	AA		B	
〃	5- 69	AA		B	
〃	5- 70	AA		B	
〃	5- 74	AA		B	
〃	5- 75	AA		B	
〃	5- 76	AA		B	
〃	5- 77	AA		B	
〃	5- 78	AA		B	
VHDEK04////-1	5- 65	AD		B	
〃	5- 79	AD		B	
〃	6- 18	AD		B	
VHD1SS82///-1	5- 72	AB		B	
VHD10DF1///-1	5- 73	AD		B	
VHEE102////-1	5- 68	AC		B	
VHERD39EB3/-1	5- 211	AC		B	
VHERD4.3EL1-1	5- 210	AA		B	
〃	5- 212	AA		B	
VHERD5.6FB3-1	5- 214	AC		B	
VHERD6.2EB1-1	5- 213	AB		B	
VHiF258016PC/	5- 103	AZ		B	
VHiH4728A20FS	6- 20	AV		B	
VHiH6415108-6	5- 104	BA		B	
VHiiR3M03AV-1	5- 106	AH		B	
VHiiR9393//-1	5- 99	AE		B	
〃	5- 102	AE		B	
VHiLH52250A90	5- 96	AX		B	
VHiMC74HC00-1	5- 90	AE		B	
VHiM54567P/-1	5- 101	AK		B	
〃	5- 105	AK		B	
VHiSMA4392/-1	5- 97	AN		B	
VHiSTA401A/-1	5- 98	AP		B	
〃	5- 100	AP		B	
VHiSTR2024/-1	7- 6	AR		B	
VHiTD62503P-1	5- 91	AG		B	
VHi27010RAF1A	5- 94	BF	N	B	
VRD-HT2EY472J	1- 112	AA		C	
VRD-RB2HY394J	8- 5	AA		C	
VRD-RB2HY561J	5- 114	AA		C	
VRD-RC2EY000J	5- 200	AA		C	
〃	6- 27	AA		C	
〃	6- 28	AA		C	
VRD-RC2EY100J	5- 182	AA		C	
VRD-RC2EY101J	5- 155	AA		C	
〃	5- 163	AA		C	
〃	5- 166	AA		C	
VRD-RC2EY102J	5- 118	AA		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
VRD-RC2EY102J	5- 131	AA		C	
〃	5- 132	AA		C	
〃	5- 133	AA		C	
〃	5- 138	AA		C	
〃	5- 139	AA		C	
〃	5- 161	AA		C	
〃	5- 172	AA		C	
〃	5- 173	AA		C	
〃	5- 178	AA		C	
VRD-RC2EY103J	5- 111	AA		C	
〃	5- 112	AA		C	
〃	5- 121	AA		C	
〃	5- 123	AA		C	
〃	5- 125	AA		C	
〃	5- 127	AA		C	
〃	5- 129	AA		C	
〃	5- 130	AA		C	
〃	5- 140	AA		C	
〃	5- 142	AA		C	
〃	5- 159	AA		C	
〃	5- 162	AA		C	
〃	5- 171	AA		C	
〃	5- 174	AA		C	
〃	5- 177	AA		C	
VRD-RC2EY104J	5- 147	AA		C	
VRD-RC2EY105J	6- 26	AA		C	
VRD-RC2EY132G	5- 150	AA		C	
VRD-RC2EY182G	5- 149	AA		C	
VRD-RC2EY202J	5- 117	AA		C	
VRD-RC2EY203G	5- 153	AA		C	
VRD-RC2EY220J	5- 183	AA		C	
VRD-RC2EY221J	6- 25	AA		C	
VRD-RC2EY272J	5- 135	AA		C	
〃	5- 143	AA		C	
VRD-RC2EY273G	7- 9	AA		C	
VRD-RC2EY273J	5- 146	AA		C	
VRD-RC2EY330J	5- 124	AA		C	
〃	5- 126	AA		C	
〃	5- 141	AA		C	
VRD-RC2EY332J	5- 115	AA		C	
〃	5- 152	AA		C	
VRD-RC2EY333J	5- 136	AA		C	
VRD-RC2EY391J	5- 113	AA		C	
VRD-RC2EY392J	5- 119	AA		C	
VRD-RC2EY472G	5- 170	AA		C	
VRD-RC2EY472J	5- 122	AA		C	
〃	5- 128	AA		C	
〃	5- 137	AA		C	
〃	5- 151	AA		C	
〃	5- 157	AA		C	
〃	5- 164	AA		C	
〃	5- 179	AA		C	
VRD-RC2EY473J	5- 184	AA		C	
VRD-RC2EY562J	5- 148	AA		C	
〃	5- 156	AA		C	
〃	5- 160	AA		C	
〃	5- 167	AA		C	
VRD-RC2EY563J	5- 144	AA		C	
〃	5- 145	AA		C	
VRD-RC2EY622J	5- 158	AA		C	
〃	5- 165	AA		C	
VRD-RC2EY623J	5- 116	AA		C	
VRD-RC2EY682J	5- 154	AA		C	
VRD-RC2EY822G	5- 168	AA		C	
VRD-RC2EY912G	5- 169	AA		C	
VRNRC2EK1002F	5- 176	AA		C	
VRNRC2EK1201F	5- 175	AA		C	
〃	5- 180	AA		C	
VRNRC2EK1303F	5- 134	AA		C	
VRNRC2EK3601F	5- 181	AA		C	
VRS-RE3AAR68J	5- 120	AA		C	
VSJA101-///-1	5- 202	AB		B	
VSJC501-///-1	5- 201	AB		B	
〃	5- 204	AB		B	
VS2SA673-//-1	5- 203	AD		B	
VS2SC4153-/-1	5- 206	AG		B	
〃	5- 207	AG		B	
VS2SD667-//-1	5- 205	AD		B	
VVKH9MT10Z/-1	9- 4	AY		B	
VVK11MT77GK-1	6- 35	AY		B	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
〔X〕					
XBBSC30P06000	1- 8	AA		C	
XBBSC30P20000	2- 32	AA		C	
XBPBZ40P06K00	2- 19	AA		C	
XBPSD23P10000	3- 8	AA		C	
XBPSD26P04K00	1- 26	AA		C	
XBPSD30P04KS0	11- 24	AA		C	
XBPSD30P05K00	3- 15	AA		C	
XBPSD30P06KS0	2- 44	AA		C	
XBPSD30P06K00	1- 22	AA		C	
XBPSD30P08KS0	5- 220	AA		C	
〃	7- 13	AA		C	
XBPSD30P08000	5- 221	AA		C	
XBPSD30P14KS0	7- 14	AA		C	
XBPSD40P06KS0	11- 25	AA		C	
XBPSD40P06K00	3- 26	AA		C	
XBPSD40P06000	3- 18	AA		C	
XBPSD40P22000	11- 15	AA		C	
XBSSD30P08000	5- 222	AA		C	
XBSSD40P16000	11- 13	AA		C	
XCPSD30P12X00	2- 6	AA		C	
XCTSD40P06000	3- 58	AA		C	
XEBSD30P06000	1- 21	AA		C	
〃	2- 35	AA		C	
XEBSD30P08000	1- 35	AA		C	
〃	2- 12	AA		C	
XFPSD30P06000	3- 49	AA		C	
XHBSD30P08000	1- 19	AA		C	
〃	3- 1	AA		C	
XHPSD40P08KS0	2- 38	AA		C	
XNESD30-24000	2- 27	AA		C	
〃	5- 223	AA		C	
〃	7- 15	AA		C	
XNESD40-32000	11- 16	AA		C	
XNESD60-50000	3- 33	AA		C	
XRESP30-06000	3- 53	AA		C	
XRESP40-06000	3- 52	AA		C	
XTPSD40P16000	11- 12	AA		C	
XUBSD30P10000	2- 46	AC		C	
XUBSD40P08000	2- 1	AA		C	
XUPSD23P08000	1- 27	AA		C	
XUPSD30P06000	3- 21	AA		C	
XUPSD30P16000	2- 51	AA		C	
XUSSD40P20000	11- 14	AA		C	
XWHSD26-05075	3- 12	AA		C	
XWHSD30-05080	11- 26	AA		C	
XWSSD60-15000	3- 33	AA		C	
〔0〕					
0ALW-P5107-51	1- 104	AC		C	
0ALW-P5109-51	1- 105	AC		C	
0ALW-P9002-01	1- 101	AC		B	
0ALW-P9003-01	1- 102	AC		C	
0ALW-P9003-50	1- 103	AC		C	
0ALZD2006-670	1- 43	AA		C	
0ALZV12CK104E	1- 110	AD		C	
0ALZW8AA473DJ	1- 109	AA		C	
0ALZY03600874	1- 107	AH		B	
0ALZZ05200138	1- 106	AQ		B	
0AL101KFG-001	1- 40	AV		C	
0AL421KFG-001	1- 41	BB		C	
0AL9090E1002R	1- 42	BK		E	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	